

CARD CAP	NAME	EXTENDER PIN CIRCUIT		CUST ENG REF DWG	FIELD REPLACEMENT	PRODUCTION CARD ASM
		1	2			
	CTDL FAMILY DELAY INFO 3 SHEETS			729955		
	SDTDL FAMILY DELAY INFO 4 SHEETS			729954		
AA F-	ALLOY UNIVERSAL DELAY CIRCUIT	G		729800	371884	371884
AD B-	CARD ASM TSTR ALY STOR ADDRESS REG			729801	373000	373000
AE A-	CTDL LOAD CARD			729802	371929	371929
AE C-	ALLOY HAMMER DRIVER LATCH			729803	371940	371940
AE D-	CTDL HIGH SPEED TRIGGER			729804	371946	371946
AE N-	ALLOY HAMMER DP LATCH - HIGH SPEED			729805	371415	371415
AE E-	POWER SUPPLY SEQUENCING			729953	370429	371945
AJ M-	POWER SUPPLY SEQUENCING			729953	370429	370429
AJ T-	ALLOY DIODES TYPE AAS			729902	370564	370564
AK B-	ALLOY MEMORY THERMAL SWITCHES			729806	370425	370425
AK C-	MEMORY EMITTER RESISTORS			729807	370426	370426
AM --	ALLOY ONE WAY N BLOCK			729808	370904	371203
*AQ U-	ALLOY SWITCH DECODER NO 2			729809	370833	370833
AQ V-	ALLOY Z DRIVER 12V			729810	370834	370834
AQ W-	ALLOY CURRENT SOURCE			729811	370835	370835
AQ X-	SENSE FINAL AMPLIFIER			729812	370836	370836
AS U-	SENSE AMPL RECTIFIER & CLIPPER			729956	372285	372285
CA C-	CTDL & AND GATE			729813	371922	371922
CE A-	DELAY LINE LUMPED 1 USEC			729814	371944	371944
CE D-	STANDARD CABLE TERMINATOR			729815	370145	370145
CE E-	CTDL PNP THREE WAY & GATE			729816	370140	370140
*CE H-	CTDL INVERTER LATCH NPN			729817	370139	370139
*CE K	CTDL PNP INVERTER LATCH			729818	370143	370143
CE M-	CTDL-CARD TSTR T LINE LATCH			729819	370357	370357
CG --	CTDL TWO WAY AND PNP NO LOADS			729820	370975	371263
CG VM	CTDL TWO WAY AND PNP TWO LOADS			729822	370975	371261
CG VV	CTDL TWO WAY AND PNP ONE LOAD			729821	370975	371262
CG WW	CTDL TWO WAY AND PNP ALL LOADS			729823	370975	371251
CH --	CTDL TWO WAY AND NPN NO LOADS			729824	370976	371266
*CH VV	CTDL TWO WAY AND NPN ONE LOAD			729825	370976	371265
*CH VM	CTDL TWO WAY AND NPN TWO LOADS			729826	370976	371264
CH WW	CTDL TWO WAY AND NPN ALL LOADS			729827	370976	371252
*CJ VU	CTDL 3 WAY AND PNP ONE LOAD	G		729828	370977	371267
*CJ WF	CTDL 3 WAY AND PNP NO LOADS	G	P	729829	370977	371268
CJ WV	CTDL 3 WAY AND PNP ALL LOADS	G		729830	370977	371253
*CJ YC	CTDL 3 WAY AND PNP ALL LOADS	G	P	729831	370977	371071
*CK VU	CTDL 3 WAY AND NPN ONE LOAD	G		729832	370978	371269
*CK WF	CTDL 3 WAY AND NPN NO LOADS	G	P	729833	370978	371270
*CK WV	CTDL 3 WAY AND NPN ALL LOADS	G		729834	370978	371254
*CK YC	CTDL 3 WAY AND NPN ALL LOADS	G	P	729835	370978	371072
CL VO	CTDL EXTENDER CARD			729836	370979	371255
CL VR	CTDL EXTENDER CARD			729837	370979	371075
CL VS	CTDL N OR EXTENDER CARD			729838	370979	371074
CL VT	CTDL P OR EXTENDER CARD			729839	370979	371073
CM --	CTDL COUPLING NETWORK			729840	371256	371256
*CN WT	CTDL EMITTER FOLLOWER NPN			729841	371260	371260
CN WU	CTDL TRANSLATE BLOCK NPN			729842	371258	371258
CP WT	CTDL EMITTER FOLLOWER PNP			729843	371259	371259
CP WU	CTDL TRANSLATE BLOCK PNP			729844	371257	371257

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PART NO. 0723162 NAME SMS CARD AND CAP CODE INDEX MACH 1401 E C NO. 119493 LOGIC NO. 99.99.99.9 TA NO. 1841D SHEET 2 OF 4 19.2.64

CARD CAP	NAME	EXTENDER CIRCUIT 1 2	PIN	CUST LNG REF DWG	FILLD REPLACEMENT	PRODUCTION CARD ASM
CQ --	CTDL ONE WAY PNP NO LOADS	N	B	729845	370981	371273
*CQ YG	CTDL ONE WAY PNP ONE LOAD	N	B	729846	370981	371276
CQ ZT	CTDL ONE WAY PNP 2 LOADS	N	B	729847	370981	371272
CQ ZV	CTDL ONE WAY PNP ALL LOADS	N	B	729848	370981	371271
*CR --	CTDL ONE WAY NPN NO LOADS	N	B	729849	370980	371276
*CR YG	CTDL ONE WAY NPN ONE LOAD	N	B	729850	370980	371277
*CR ZT	CTDL ONE WAY NPN 2 LOADS	N	B	729851	370980	371275
*CR ZV	CTDL ONE WAY NPN ALL LOADS	N	B	729852	370980	371274
CM --	CTDL TRIGGER			729853	371534	371534
CY --	CTDL POWER INVERTER	A	P	729854	371542	371542
UA B-	DTDL AND GATE			729855	371924	371924
DA Z-	DIFF BASE OSCILLATOR 240KC S L GATED			729903	370127	370127
UB Z-	CONV DIFF BASE S P LINE TO SDTRL			729904	370385	370385
DC K-	CONV DIFF BASE N L TO SDTRL OR SDTDL			729905	370468	370468
DE F-	SDTDL FOUR 2 WAY N AND LOG BKCS W LDS			729906	370216	370216
DE G-	SDTDL 4 2 WAY N & LOGIC BLKS W/O LDS			729907	370217	370217
UE J-	SDTDL 3 WAY IN & LOGIC BLK W/O LOADS			729908	370219	370219
UF J-	TDL & TRL LOAD CARD			729909	370232	370232
UF Q-	SDTDL INVERTING POWER DRIVER			729910	370225	370225
UF R-	SDTDL NON INVERTING POWER DRIVER			729911	370226	370226
UG P-	CARD ASM TSTR CLK & WITH EMIT FOL DR			729856	370343	370343
UG Q	CARD ASM TSTR CLK & WITH EMIT DR			729857	370342	370342
UG S-	SDTDL INDICATOR DRIVER			729912	370347	370347
*UG T-	SDTDL 2 WAY LOGIC BLK LOW SP W LDS			729913	370380	370380
*UG U-	SDTDL 2 WAY LOGIC BLK LOW SP W/O LDS			729914	370379	370379
*UG V-	SDTDL 2 WAY LOGIC BLK LOW SP W LDS			729915	370378	370378
*UG W-	SDTDL 3 WAY LOGIC BLK LOW SP W/O LDS			729916	370377	370377
*UG X-	SDTDL 5 WAY LOGIC BLK LOW SP W LDS			729917	370376	370376
*UG Y-	SDTDL 5 WAY LOGIC BLK LOW SP W/O LDS			729918	370953	370375
*UG Z-	SDTDL 10 WAY LOG BLK LOW SP W LOAD			729919	370373	370373
*DH A-	SDTDL 10 WAY LOG BLK LOW SP W/O LOADS			729920	370953	370374
*DH B-	SDTRL INVERTER LOW SPEED WITH LOAD			729921	370950	370348
*DH C-	SDTDL INVERTER LOW SPEED W/O LOAD			729922	370950	370372
*DH D-	SDTDL & SDTRL 3K RESISTOR CARD			729923	370371	370371
*DH E-	SDTRL SINGLE SHOT			729924	370262	370262
DH F-	SDTDL TRIGGER AND DRIVER			729925	370350	370350
DH G-	SDTDL RAND W RFG BIT POS			729926	370351	370351
*DH H-	SDTDL DBL LEVEL LB #2A LOW SP NO LDS			729927	370358	370358
*DH J-	SDTDL MUP NUMBER 4			729928	370352	370352
DH K-	SDTDL LATCH WITH GATE OUT			729929	370349	370349
DK A-	ALLOY CURRENT SOURCE			729858	370443	370443
DZ A-	SENSE AMPL RECTIFIER & CLIPPER			729957	372359	372359
EY --	DRIFT DRIVER RESISTOR			729930	371199	371199
*FP --	ALLOY LOAD RESISTOR			729859	371453	371453
FT --	ALLOY OSC 360KC FREE RUN CRYSTAL			729860	371405	371405
FN --	ALLOY SWITCHES			729861	371490	371490
*GJ --	GENERAL PURPOSE FILTER CARD			729862	371501	371501
GK --	CABLE DE COUPLE CARD			729931	371533	371533
*HN --	ALLOY DRIVERS READ WRITE VM			729863	371463	371463
JB --	CTRL OSC 10KC FREE RUNNING CRYSTAL			729932	371245	371245
JF --	CTDL HI SPEED 1 WAY PNP NO LOADS			729864	370982	371579
DJE-	TSTR FILE OPERATION DECODE				373333	373333
DJF-	LINE DRIVERS				373335	373335
DJD-	FILE PROGRAM SKIP				373336	373336

DATE E C NO. DATE E C NO. DATE E C NO. DATE E C NO.
 1A 01-30-61 109511J 1B 03-25-61 110429 1C 06-12-61 110429A 1D 10-03-61 110429B
 1E 11-14-61 112270F 1F 12-06-61 112912 1G 06-14-62 115599 1H 11-07-62 116740
 1I 12-03-63 119493

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PART NO. 0723162 NAME SMS CARD AND CAP CODE INDEX MACH 1401 E C NO. 119493 LOGIC NO. 99.99.99.9 TA NO. 1841D SHEET 3 OF 4 19.2.64

CARD CAP	NAME	EXTENDER PIN CIRCUIT 1 2	CUST ENG REF DWG	FILLD REPLACEMENT	PRODUCTION CARD ASN
JF VA	HIGH SPEED ONE WAY PNP ONE LOAD		729865	370982	371578
JF VN	CTDL HIGH SPEED ONE WAY PNP TWO LOAD		729866	370982	371577
JF VP	CTDL HIGH SPEED ONE WAY PNP ALL LOAD		729867	370982	371576
JG --	CTDL HI SPEED 2 WAY AND PNP NO LOADS		729868	370983	371583
JG VV	CTDL HI SPEED 2 WAY AND PNP ONE LOAD		729869	370983	371582
JG VW	CTDL HI SPEED 2 WAY AND PNP 2 LOADS		729870	370983	371591
JG WW	CTDL HI SPEED 2 WAY AND PNP ALL LOAD		729871	370983	371580
JH --	CTDL HIGH SPEED 3 WAY AND NO LOADS	G	729872	370984	371586
JH VU	CTDL HI SPEED 3 WAY AND PNP ONE LOAD	G	729873	370984	371585
JH WV	CTDL HI SPEED 3 WAY AND PNP ALL LOAD	G	729874	370984	371584
JJ --	CTDL HIGH SPEED ONE WAY NPN NO LOADS		729875	370985	371590
JJ VA	CTDL HIGH SPEED ONE WAY NPN ONE LOAD		729876	370985	371589
JJ VN	CTDL HI SPEED 1 WAY TWO LOADS		729877	370985	371588
JJ VP	CTDL HIGH SPEED ONE WAY NPN ALL LOAD		729878	370985	371587
JL VB	CTDL LOGIC INVERTER PNP ALL LOADS		729879	371077	371077
JM VB	CTDL LOGIC INVERTER NPN ALL LOADS		729880	371079	371079
JN --	CTDL TRIGGER GATE EXTENDER		729881	371081	371081
JZ --	CTDL TRIGGER NO 2		729882	371082	371082
KA --	INDICATOR DRIVER 40 MA		729883	371546	371546
NB --	CTDL SINGLE SHOT T INPUT	B	729884	371591	371591
NC --	CTDL SINGLE SHOT U INPUT	N	729885	371592	371592
NG TF	CTDL INTEGRATOR -U AND -T		729886	371635	371635
NG XX	CTDL INTEGRATOR -U AND -T		729887	371996	371996
NT --	ALLOY DIFFERENCE AMPLIFIER		729888	371671	371671
NU --	CTDL POWER INVERTER TYPE	A P	729889	371676	371676
NW --	270 MEG RESISTOR CARD		729890	371598	371598
PP --	CTDL EMITTER FOLLOWER PNP		729891	371365	371365
PQ --	CTDL EMITTER FOLLOWER NPN		729892	371370	371370
QC --	ALLOY CLUTCH MAGNETIC DRIVER		729893	371633	371633
QD --	ALLOY RELAY DRIVER		729894	371078	371078
RK --	ALLOY OSC 347.5KC FREE RUN CRYSTAL		729895	371788	371788
TA B-	SDTRL 93 COAX LINE DR DISPERSED LDS		729933	370266	370066
TB G-	SDTRL OSCILLATOR 320 KC S LINE GATED		729934	370296	370296
TB Q-	SDTRL OSCILLATOR 115 KC S LINE GATED		729935	370295	370295
TB R-	SDTRL OSCILLATOR 360 KC S LINE GATED		729936	370297	370297
TB S-	SDTRL OSCILLATOR 667 KC S LINE GATED		729937	370298	370298
TB V-	SDTRL OSCILLATOR 1 MC S LINE GATED		729938	370299	370299
TC K-	SDTRL END OF LINE TERMINATORS		729939	370334	370334
TD B-	SDTRL DIST LINE TERM W OPT LD RESIST		729940	370389	370389
TD C-	SDTDL SDTRL 6.67 KC OSCILLATOR		729941	370401	370401
TD D-	SDTDL SDTRL 115 KC OSCILLATOR		729942	370400	370400
TD E-	SDTDL SDTRL 240 KC OSCILLATOR		729943	370399	370399
TD F-	SDTDL SDTRL 320 KC OSCILLATOR		729944	370398	370398
TD G-	SDTDL SDTRL 360 KC OSCILLATOR		729945	370397	370397
TD H-	SDTDL SDTRL 667 KC OSCILLATOR		729946	370396	370396
TD K-	SDTDL SDTRL 1 MC OSCILLATOR		729947	370551	370551
WL --	ALLOY SENSE AMPLIFIER NO 2		729896	371898	371898
WX --	ALLOY AMPLIFIER PRE SENSE NO 1		729897	371899	371899
YB Y-	SENSE AMPL INPUT FILTER AND SEL GATE		729948	370417	370417
YB Z-	SENSE AMPL RECTIFIER & CLIPPER		729949	370418	370418
YC A-	SENSE AMPL-CLIPPING LEVEL CONTROL		370419	370419	370419
TF M-	SDTDL SDTRL 960 KC OSCILLATOR			370818	370818
WG --	ALLOY DRIVER CURRENT			371790	371790
YJ G-	SENSE AMPL RECTIFIER AND CLIPPER #2			370825	370825

DATE E C NO. DATE E C NO. DATE E C NO. DATE E C NO.
 1A 01-30-61 109511J 1B 03-25-61 110429 1C 06-12-61 110429A 1D 10-03-61 110429B
 1E 11-14-61 112270F 1F 12-06-61 112912 1G 06-14-62 115599 1H 11-07-62 116740
 1I 12-03-63 119493

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PART NO. 0723162 NAME SMS CARD AND CAP CODE INDEX MACH 1401 E C NO. 119493 LOGIC NO. 99.99.99.9 TA NO. 1841D

SHEET 4 OF 4

19.2.64

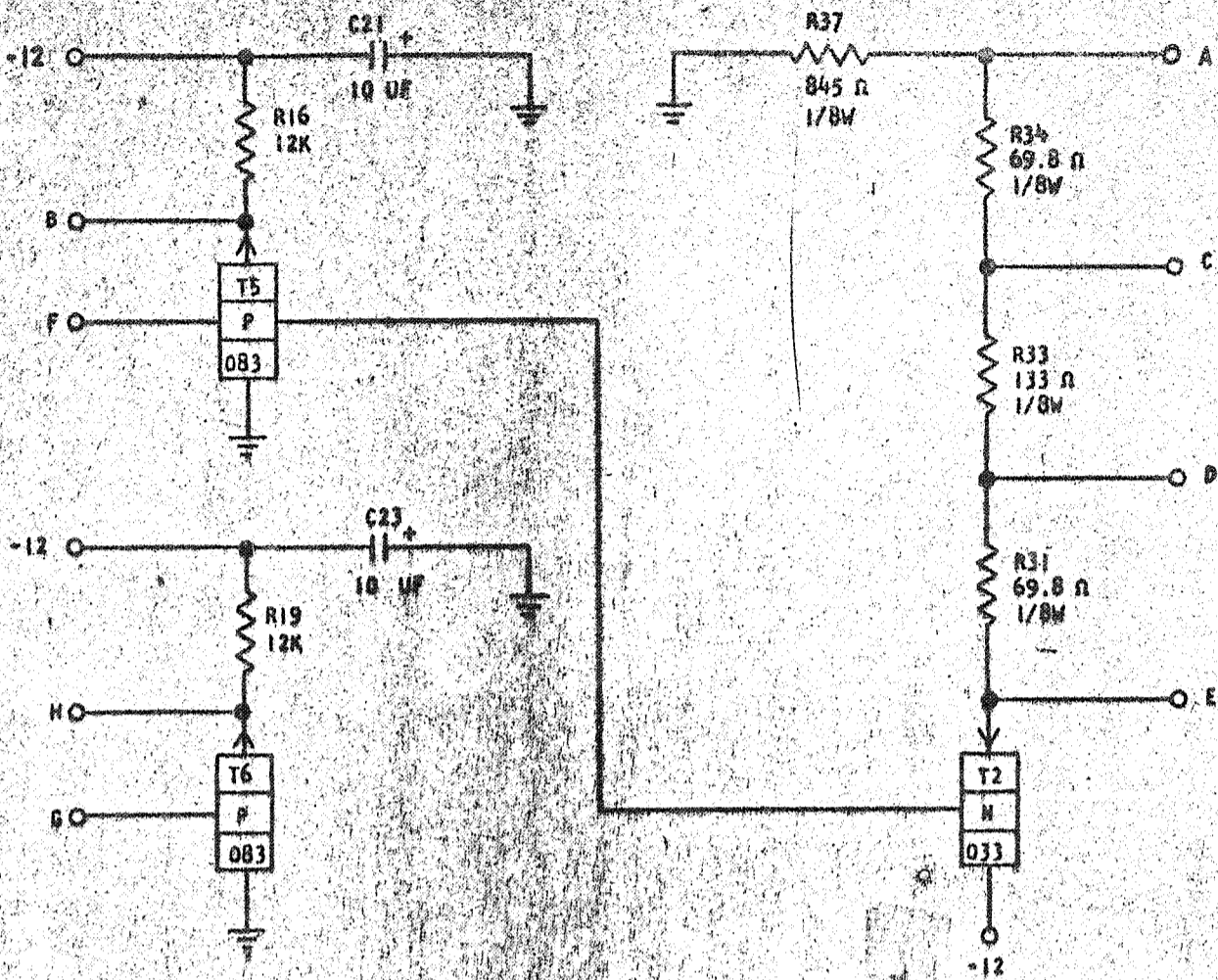
CARD CAP	NAME	EXTENDER PIN		CUST LNG REF DWG	FIELD REPLACEMENT	PRODUCTION CARD ASM
		CIRCUIT 1	CIRCUIT 2			
YC B-	SENSE AMPL SEL G READ G & BD P CTRL			729950	370420	370420
YC C-	PEAK DETECTOR INTEGATOR & V M DRIVER			729951	370421	370421
YD M-	SENSE AMPLIFIER CLIPPING LEVEL CTR			729952	370501	370501
YG A-	POWER SUPPLY 6V OVERVOLTAGE			370575	370575	370575
YG B-	POWER SUPPLY 12V OVERVOLTAGE			370576	370576	370576
YG D-	POWER SUPPLY 30V OVERVOLTAGE			370578	370578	370578
YG E-	POWER SUPPLY 20V OVERVOLTAGE			370579	370579	370579
YG F-	POWER SUPPLY 20V AMPLIFIER			370607	370607	370607
YG G-	POWER SUPPLY 30V AMPLIFIER			370608	370608	370608
YG K-	POWER SUPPLY 20V 15A AMPLIFIER			370611	370611	370611
YG L-	POWER SUPPLY 6V AMPLIFIER			370612	370612	370612
YG M-	POWER SUPPLY 12V AMPLIFIER REF-6V			370613	370613	370613
YG Q-	POWER SUPPLY 3V AMPLIFIER			370616	370616	370616
2J MX	CTDL NPN TWO WAY GATE W/ COLL LOAD			729898	370144	370144
3J MX	PNO TWO-WAY WITHOUT COLLECTORS LD			729899	370141	370141
4J MX	CTDL PNP TWO WAY GATE WITH COLL LOAD			729900	370142	370142
6J XD	CTDL STANDARD CABLE DRIVER			729901	370089	370089
AM	ALLOY-FIELD REPLACEMENT, AM CARD			370904		370904
CG	CTDL 2 WAY AND PNP FIELD REPLACEMENT			370975		370975
CH	CTDL 2 WAY AND NPN FIELD REPLACEMENT			370976		370976
CJ	CTDL 3 WAY AND PNP FIELD REPLACEMENT			370977		370977
CK	CTDL 3 WAY AND NPN FIELD REPLACEMENT			370978		370978
CL	CTDL EXTENDER CARD FIELD REPLACEMENT			370979		370979
CO	CTDL 1 WAY PNP FIELD REPLACEMENT			370981		370981
CR	CTDL 1 WAY NPN FIELD REPLACEMENT			370980		370980
JF	CTDL HI SPEED 1 WAY PNP FLD REPLACE			370982		370982
JG	CTDL HI SPEED 2 WAY AND PNP FLD REP			370983		370983
JH	CTDL HI SPEED 3 WAY AND PNP FLD REP			370984	370984	370984
JJ	CTDL HI SPEED 1 WAY NPN FLD REPLACE			370985	370985	370985

DATE E C NO. DATE E C NO. DATE E C NO. DATE E C NO.
 1A 01-30-61 109511J 1B 03-25-61 110429 1C 06-12-61 110429A 1D 10-03-61 119429B
 1E 11-14-61 112270F 1F 12-06-61 112912 1G 06-14-62 115599 1H 11-07-62 116740
 1I 12-03-63 119493

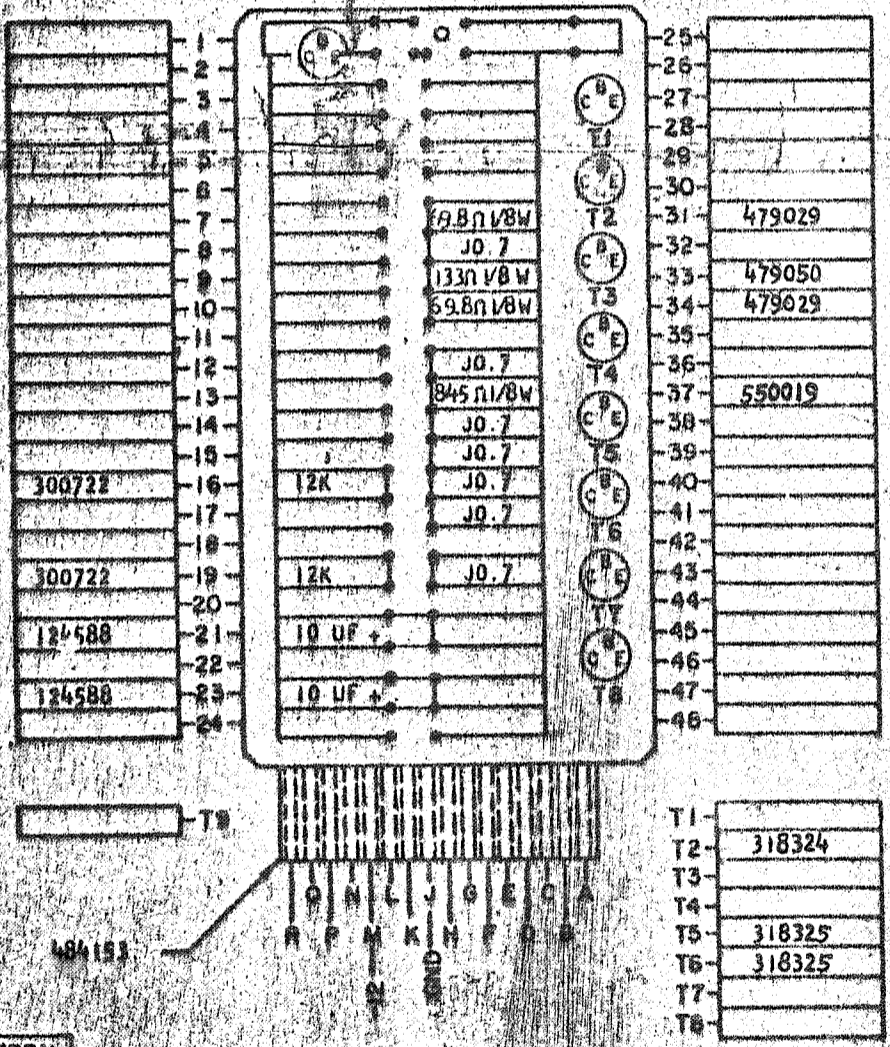
723162/4

SENSE AMPLIFIER-CLIPPING LEVEL CONTROL

STANDARDS CODE 370N19
2-7045 Y C A



- NOTES
- X CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 892419
 - XI ASSEMBLE TO ENGINEERING SPECIFICATION 895396 AND 891999
 - XII ALL RESISTORS ARE 1/2 WATT AND 5% UNLESS OTHERWISE NOTED (AS NOTE XIII)
 - XIII "J" IN BLOCK DENOTES BARE WIRE JUMPER 491296
 - XIV ALL 1/8 WATT RESISTORS ARE A15
 - XV



B

CIRCUIT AND PACKAGING STANDARD		HOLE PATTERN		COMPONENT SIDE			
APPROVAL	DATE	493457		T1	318324	033	
KMT	12-13-60			T2			
INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	DEVELOPMENT NO.
NAME CARD ASM YSTR - SENSE		12-20-60	110939	NOTE XV			2547-1419
AMPLIFIER-CLIPPING LEVEL CONTROL		3-2-61	111278	NOTE XV			
DESIGN VJK	11-1-60	TYPE SMS1401	10-3-61	112721	NOTE XV		
DETAIL ED	11-2-60	SCALE NONE	12-7-61	9113129	1WB		
CHECK TPA	11-15-60	DRAW VE	12-16-60				
APPRO BES	12-24-60	CHECK	12-17-60				

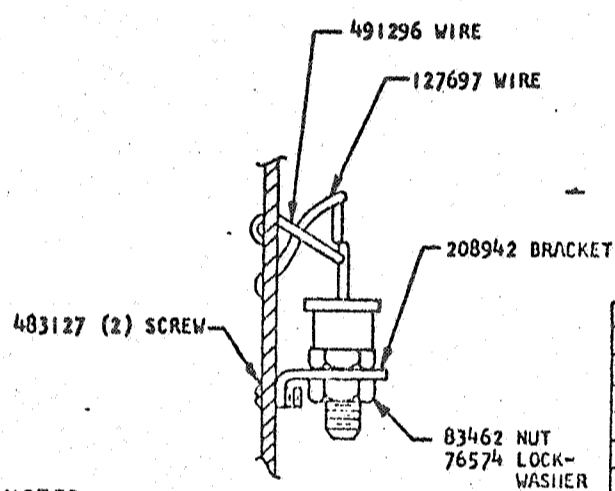
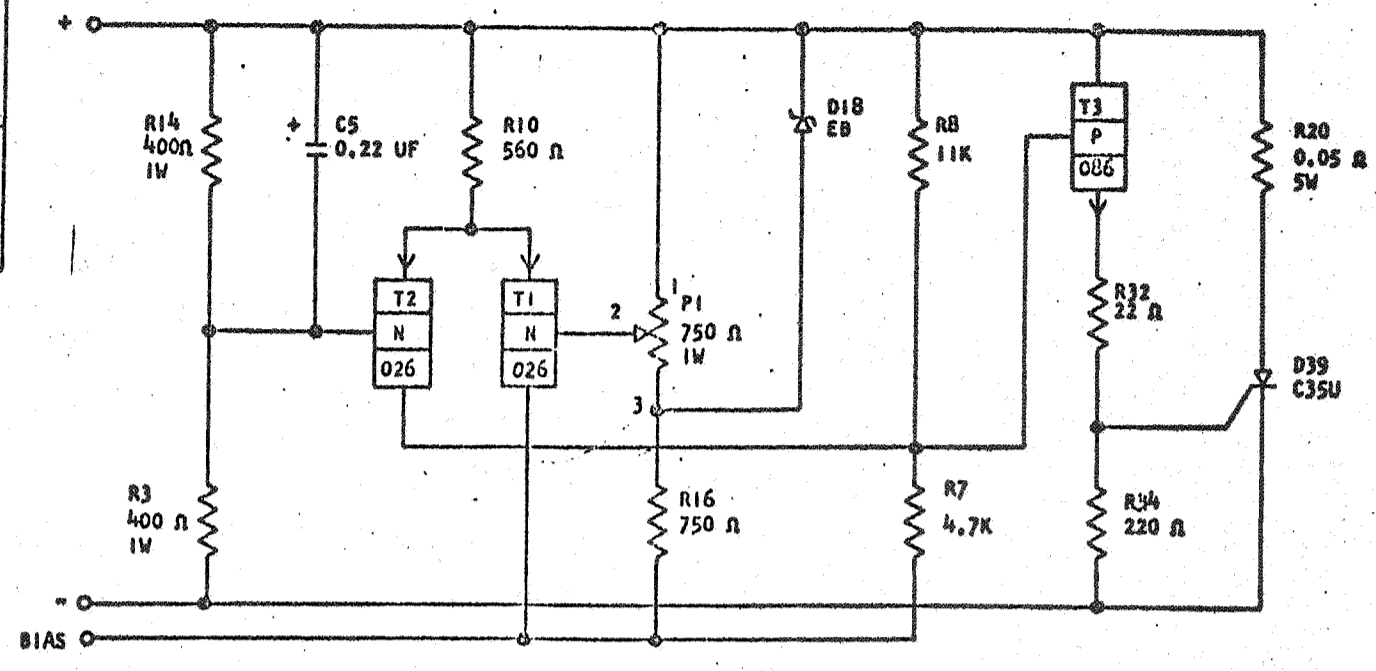
370N19
617013

370575
STANDARDS CODE
2-7045 Y G A

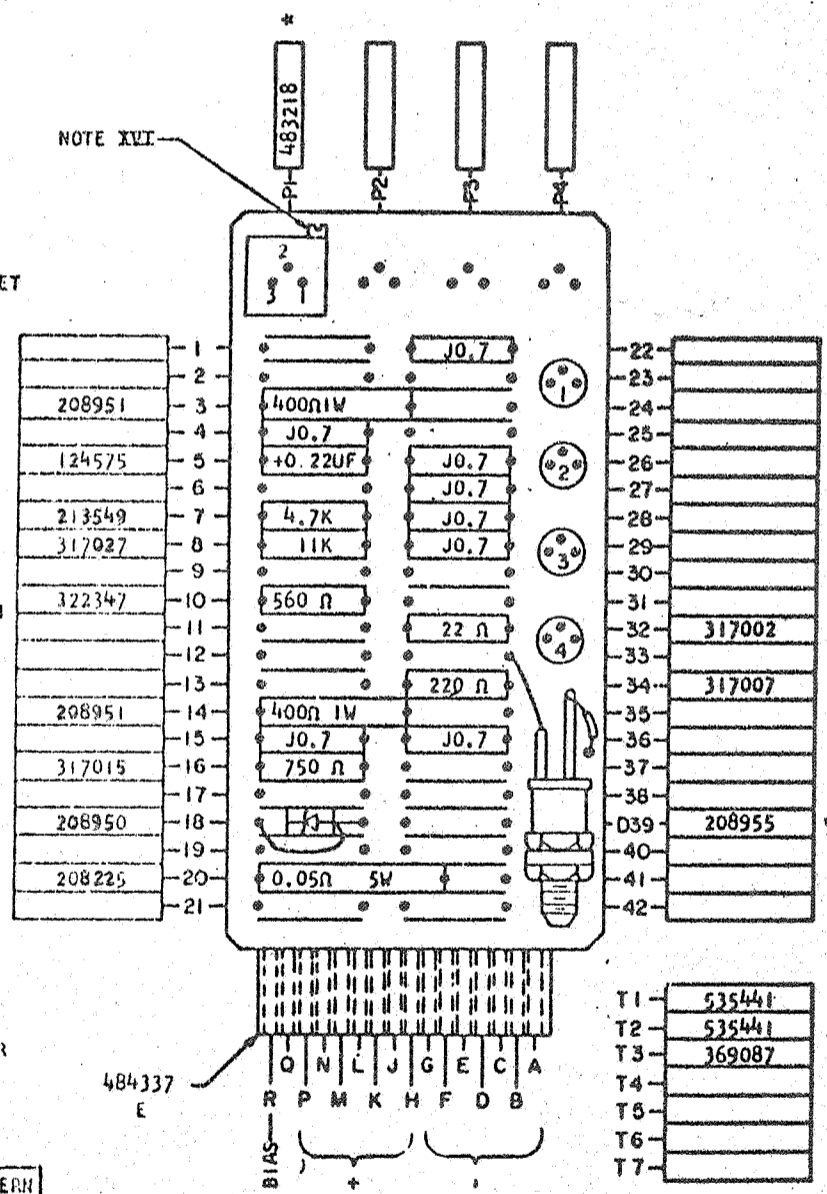
OVERVOLTAGE PROTECTION 6 VOLT

MOUNT CARDS ON ONE-INCH CENTERS NOTE XV

370575



- NOTES**
- X CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION, 892575
 - XI ASSEMBLE TO ENGINEERING SPECIFICATION 895396 AND 891999
 - XII ALL RESISTORS ARE 1/2 WATT AND ±5% UNLESS OTHERWISE NOTED (AS NOTE XIV)
 - XIII "J" IN BLOCK DENOTES BARE WIRE JUMPER, 491296
 - XIV ALL 1 WATT RESISTORS ARE ±1%
 - XV MAXIMUM HEIGHT THAT COMPONENTS MAY PROJECT ABOVE THE SURFACE OF THE CARD WILL BE .850
 - XVI EPOXY CEMENT 483002 TO BE APPLIED TO RESISTANCE TRIMMING SCREW AFTER A VOLTAGE SETTING OF 6.78^{+0.100}_{-.000} VOLTS IS MADE
 - ** XVII DIODE 208950 TO BE POSITIONED AS INDICATED
 - ** XVIII BEND DIODE LEAD NEAREST RED DOT BACK OVER DIODE BODY AS SHOWN
 - B XIX POTENTIOMETER 483218 AND CONTROL RECTIFIER 208955 NOT TO BE SUBJECTED TO LIQUIDS.



DPD CIRCUIT & PACKAGING STANDARD	
APPROVAL	DATE
JHT	1-24-62
HOLE PATTERN 493474	

INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD ASM TSTR - OVER-	5-26-61	111817	IWB	7-25-62	113606	MDL	370575 88-2125
VOLTAGE PROTECTION	6 VOLT	11-28-61	112469	IWB	4-15-63	D116148	MDL	
DESIGN	EDF 12-20-61	MODEL	SMS					
DETAIL	JH 12-29-61	SCALE	NONE					
CHECK	EDF 1-5-62	DRAW	VE 7-17-62					
APPROD	GWS 2-5-62	CHECK	KF 7-23-62					
			5-23-62					

370575

370818

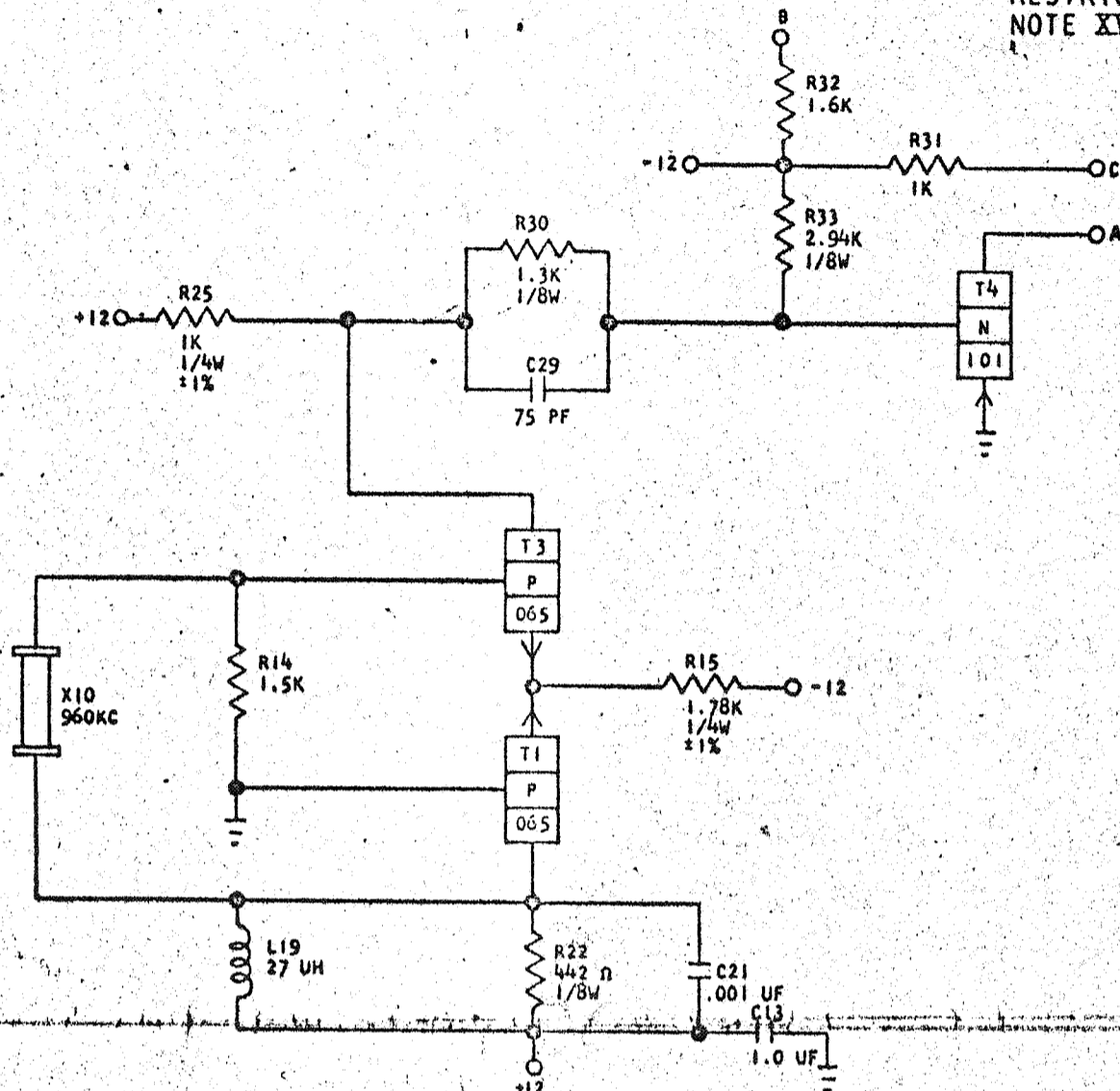
T F M -

STANDARDS CODE 2-7045

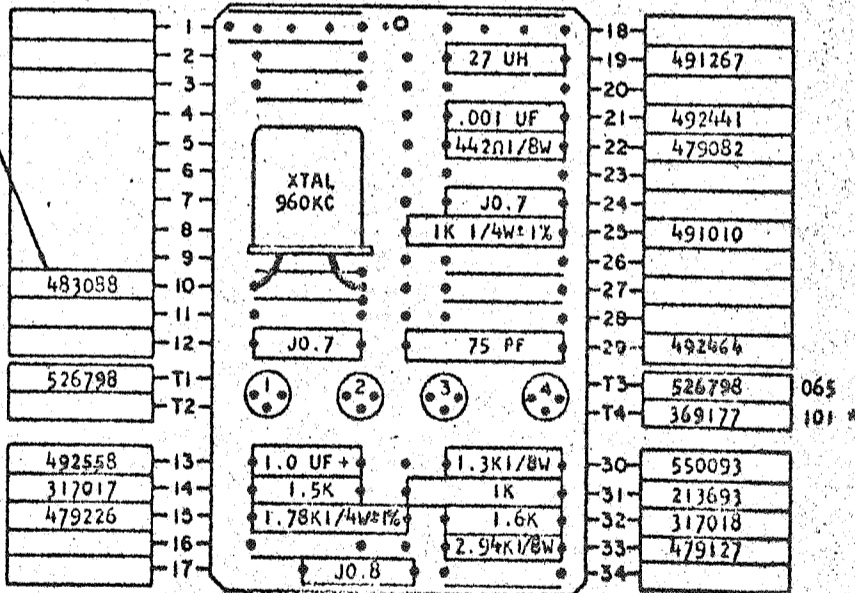
SDTDL-SDTRL-960KC CRYSTAL OSCILLATOR

370818

RESTRICTED NOTE XV



- NOTES
- I CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 892818
 - II ASSEMBLE TO ENGINEERING SPECIFICATION 893396 AND 891999
 - XII ALL RESISTORS ARE 1/2 WATT AND ±5% UNLESS OTHERWISE NOTED (AS NOTE XVI)
 - XIII "J" IN BLOCK DENOTES BARE WIRE JUMPER 491296
 - XIV APPLY FILLET OF EPOXY ADHESIVE (100601) * ALONG FULL LENGTH ON 2 SIDES TO BOND CRYSTAL TO CARD SURFACE, CURE AT 135°F ± 5°F FOR A MINIMUM OF 30 MIN.
 - * XV TECHNICAL LABORATORY EVALUATION INCOMPLETE. THIS PART SUBJECT TO WITHDRAWAL. ADDITIONAL USAGE TO BE AVOIDED.
 - XVI ALL 1/8 WATT RESISTORS ARE ±1%
 - XVII MOUNT TRANSISTOR 369177 WITH TRANSISTOR SPACER 483070
 - XVIII PART NUMBER 483088 MUST NOT BE SUBJECTED TO ANY LIQUIDS.



B

CIRCUIT AND PACKAGING STANDARD		APPROVAL		DATE		HOLE PATTERN	
KMT		9-20-61		491329			
INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE
NAME CARD ASM TSTR-SDTDL-SDTRL-960KC CRYSTAL OSCILLATOR				10-18-61	112735	NOTE XV	
DESIGN	RCB 9-15-61	MODEL	SMS 1401				
DETAIL	TPA 9-19-61	SCALE	NONE				
CHECK	3 10-2-61	DRAW	MDE 10-2-61				
APPRO	10-19-61	CHECK	3777 10-2-61				

COMPONENT SIDE

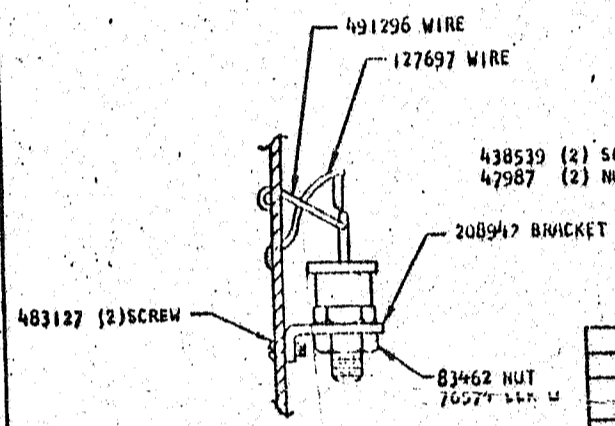
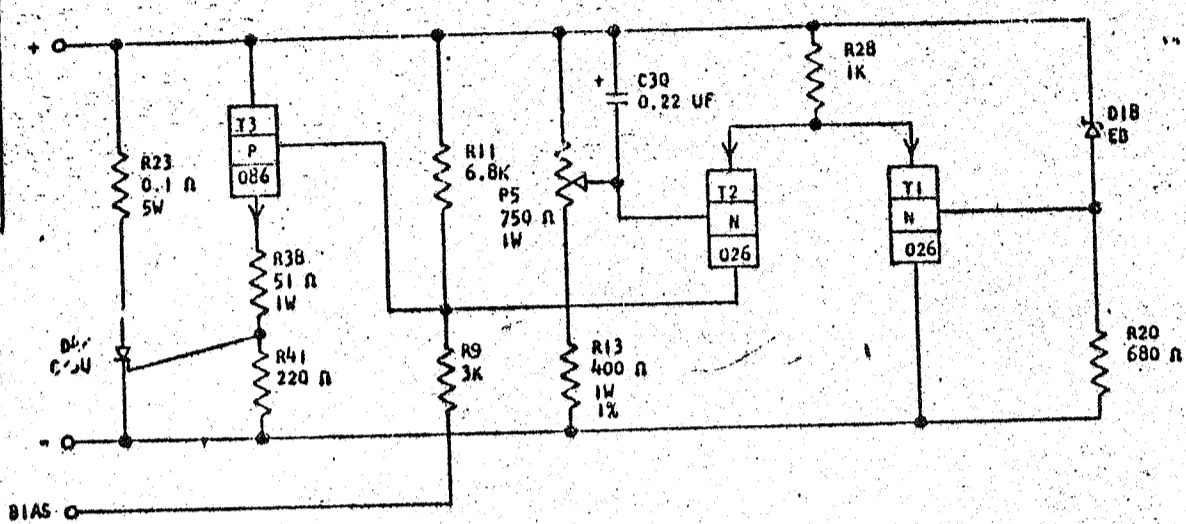
82-3977-1 6-22-61

370818

370576

OVERVOLTAGE PROTECTION 12 VOLT
MOUNT CARD ON ONE-INCH CENTERS. NOTE IX

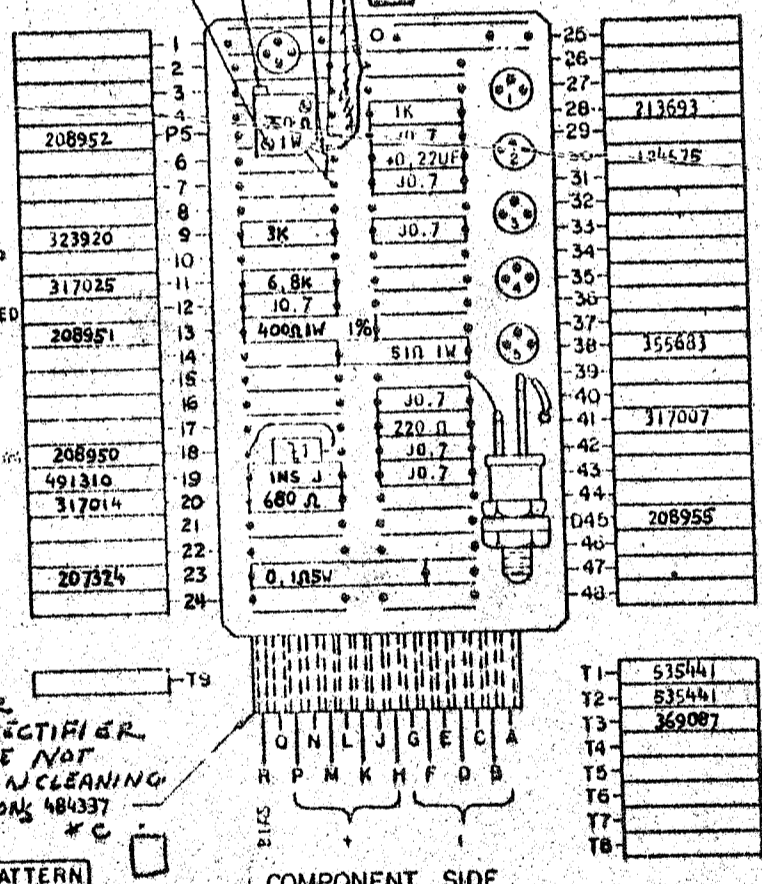
STANDARDS CODE
2-7045
370576
Y G B



NOTES

- X CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 892576.
- XI ASSEMBLE TO ENGINEERING SPECIFICATION 895396 AND 891939.
- XII ALL RESISTORS ARE 1/2 WATT AND ± 5% UNLESS OTHERWISE NOTED.
- XIII "J" IN BLOCK DENOTES BARE WIRE JUMPER 491296 UNLESS OTHERWISE SPECIFIED TO BE WELDED TO THE BOARD HAS BEEN CHANGED.
- XIV MAXIMUM HEIGHT THAT COMPONENTS MAY PROJECT ABOVE THE SURFACE OF THE CARD WILL BE .850.
- XV EPOXY CEMENT 483002 TO BE APPLIED TO RESISTANCE TRIMMING SCREW AFTER A .100 VOLTAGE SETTING OF 12.96-.000 VOLTS IS MADE.
- XVI DIODE 208950 TO BE POSITIONED AS INDICATED.
- XVII BEND DIODE LEAD NEAREST RED OUT BACK OVER DIODE BODY AS SHOWN.

* XIX ASSEMBLE POTENTIOMETER 208952 AND CONTROL RECTIFIER 208963 SO THAT THEY ARE NOT SUBJECT TO ANY PRODUCTION CLEANING OPERATIONS 484337 *C



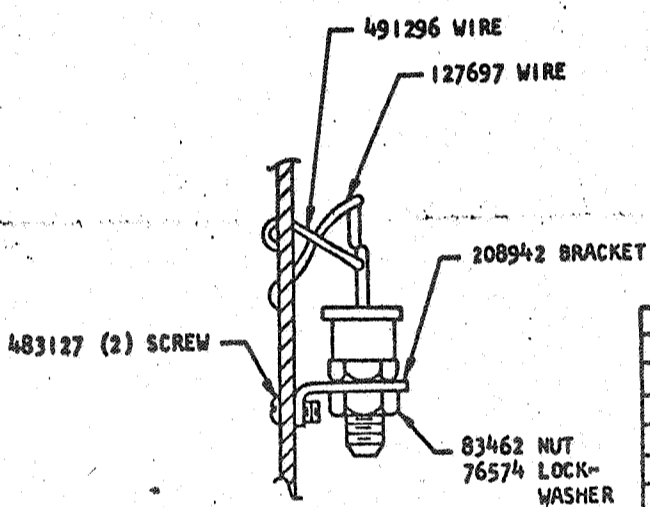
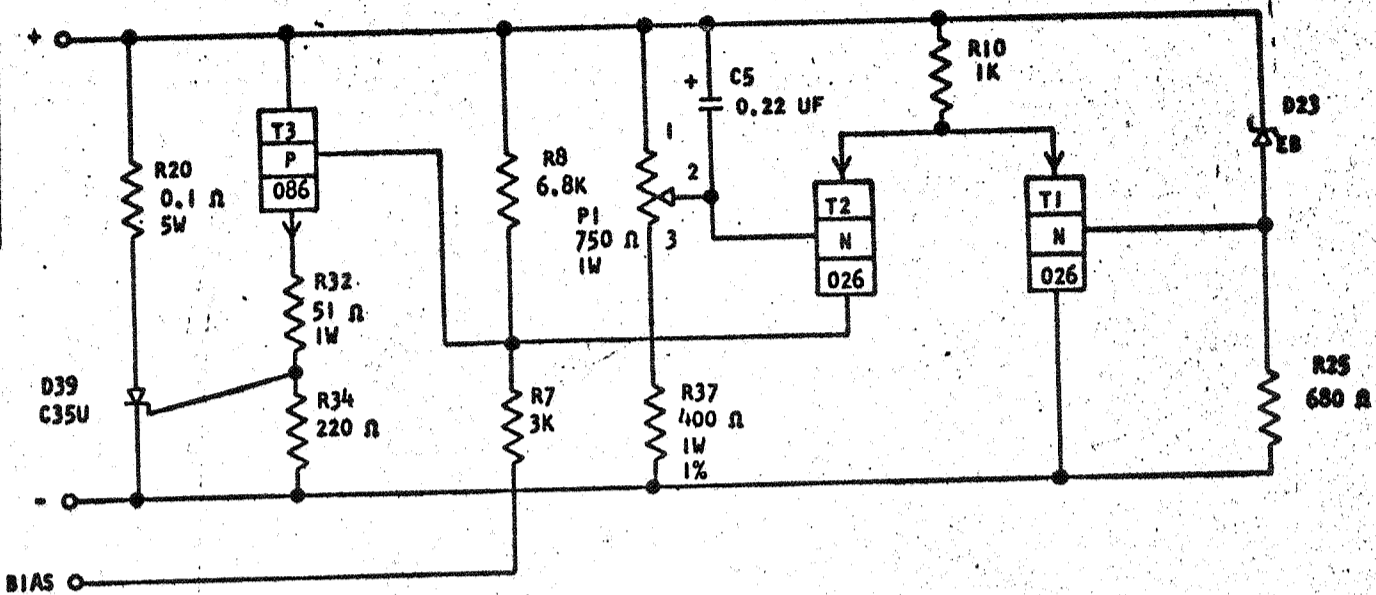
CIRCUIT AND PACKAGING STANDARD		DATE		HOLE PATTERN		APPROVAL		DATE		CHANGE NO.		APPROVAL		DEVELOPMENT NO.	
JH Toloz		1/24/62		493457		MDL		5-23-62		D113950		MDL		88-2126	
INTERNATIONAL BUSINESS MACHINES CORP.															
NAME		DATE		CHANGE NO.		APPROVAL		DATE		CHANGE NO.		APPROVAL		DEVELOPMENT NO.	
CARD ASM TSTR - OVERVOLTAGE PROTECTION 12 VOLT		5-26-61		111817		IWB		5-23-62		D113950		MDL		88-2126	
DESIGN		DATE		CHANGE NO.		APPROVAL		DATE		CHANGE NO.		APPROVAL		DEVELOPMENT NO.	
EDF 12-20-61		11-28-61		112469		IWB		12-22-61		113162		MDL			
DETAIL		DATE		CHANGE NO.		APPROVAL		DATE		CHANGE NO.		APPROVAL		DEVELOPMENT NO.	
JH 2-29-61		1-9-62		113685		MDL									
CHECK		DATE		CHANGE NO.		APPROVAL		DATE		CHANGE NO.		APPROVAL		DEVELOPMENT NO.	
EDF 1-4-62		2-4-62		113685		MDL									
APPRO		DATE		CHANGE NO.		APPROVAL		DATE		CHANGE NO.		APPROVAL		DEVELOPMENT NO.	
GWS 2-5-62		6-22-61		113685		MDL									

370576

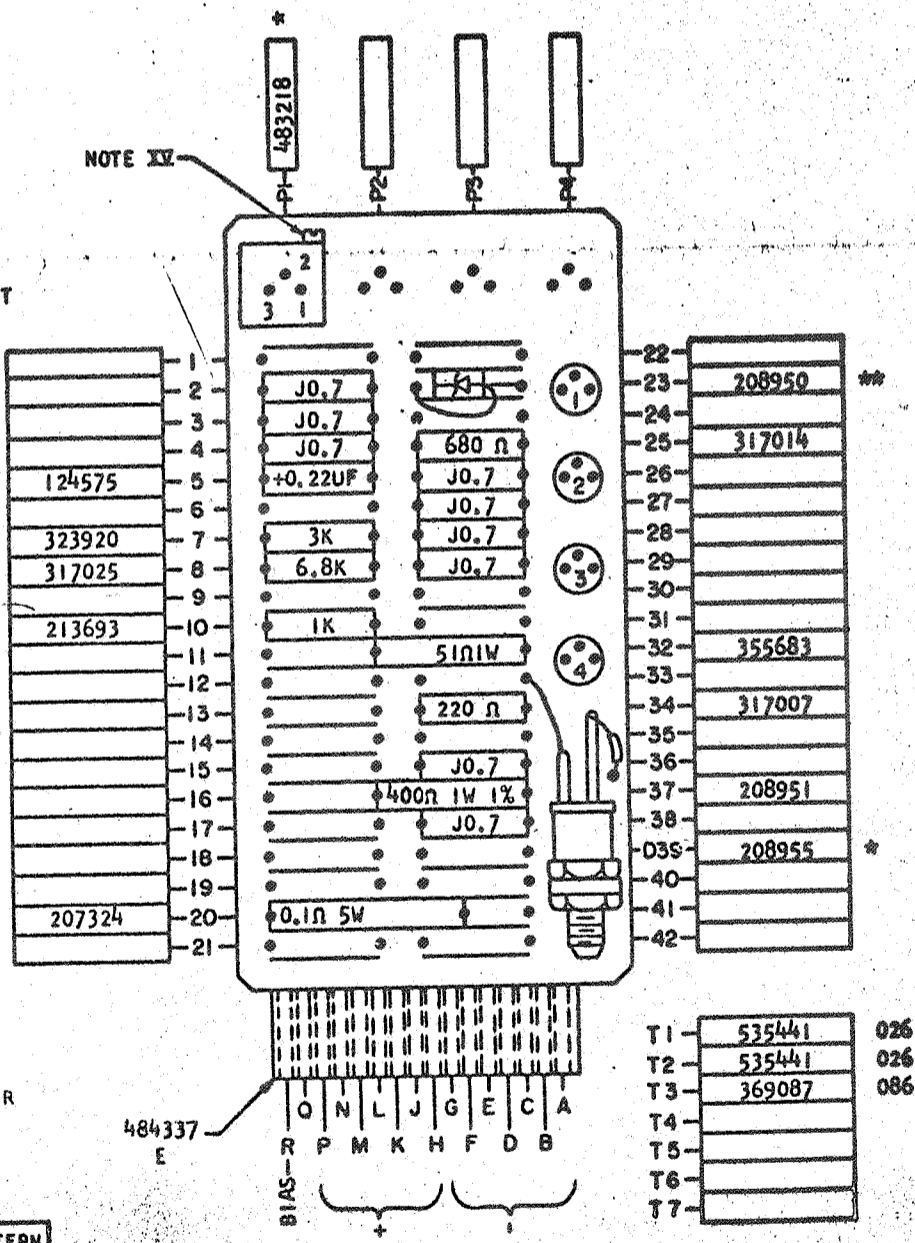
370576

OVERVOLTAGE PROTECTION 12 VOLT
MOUNT CARD ON ONE-INCH CENTERS NOTE XIX

370576
STANDARDS CODE
2-7045
Y G B -



- NOTES
- I CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 892576
 - II ASSEMBLE TO ENGINEERING SPECIFICATION 895396 AND 891999
 - III ALL RESISTORS ARE 1/2 WATT AND ±5% UNLESS OTHERWISE NOTED
 - IV "J" IN BLOCK DENOTES BARE WIRE JUMPER, 491296
 - V MAXIMUM HEIGHT THAT COMPONENTS MAY PROJECT ABOVE THE SURFACE OF THE CARD WILL BE .850.
 - VI EPOXY CEMENT 483002 TO BE APPLIED TO RESISTANCE TRIMMING SCREW AFTER A VOLTAGE SETTING OF 12.96⁺¹⁰⁰/₋₁₀₀₀ VOLTS IS MADE.
 - ** XVII DIODE 208950 TO BE POSITIONED AS INDICATED
 - ** XVIII BEND DIODE LEAD NEAREST RED DOT BACK OVER DIODE BODY AS SHOWN
 - IX POTENTIOMETER 483218 AND CONTROL RECTIFIER 208955 NOT TO BE SUBJECTED TO LIQUIDS.



DPD CIRCUIT & PACKAGING STANDARD		
APPROVAL	DATE	HOLE PATTERN
JHT	1-24-62	493474

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR - OVER-VOLTAGE PROTECTION 12 VOLT	5-26-61	111817	IWB	5-23-62	D113950	MDL	88-2126
DESIGN EDF 12-20-61 MODEL SMS	7-27-61	112417	NGJ	9-25-62	113606	MDL	
DETAIL JH 12-29-61 SCALE NONE	11-28-61	112469	IWB	4-15-63	D116148	MDL	
CHECK EDF 1-4-62 DRAW VE 7-17-62	12-22-61	113162	IWB				
APPRO GWS 2-5-62 CHECK RF 7-23-62	2-6-62	113685	MDL				

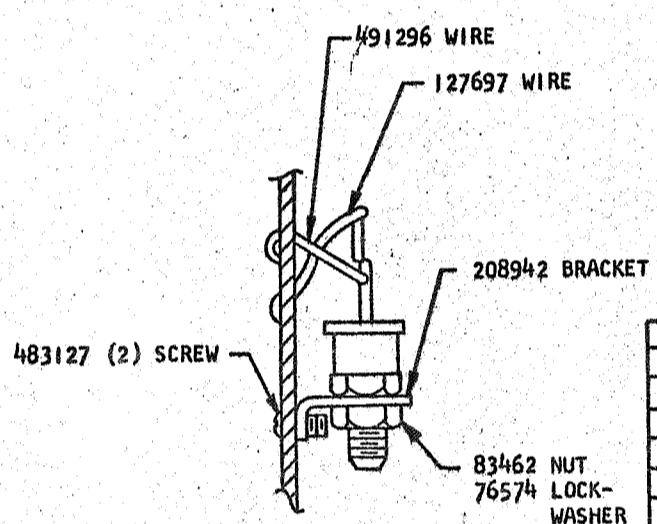
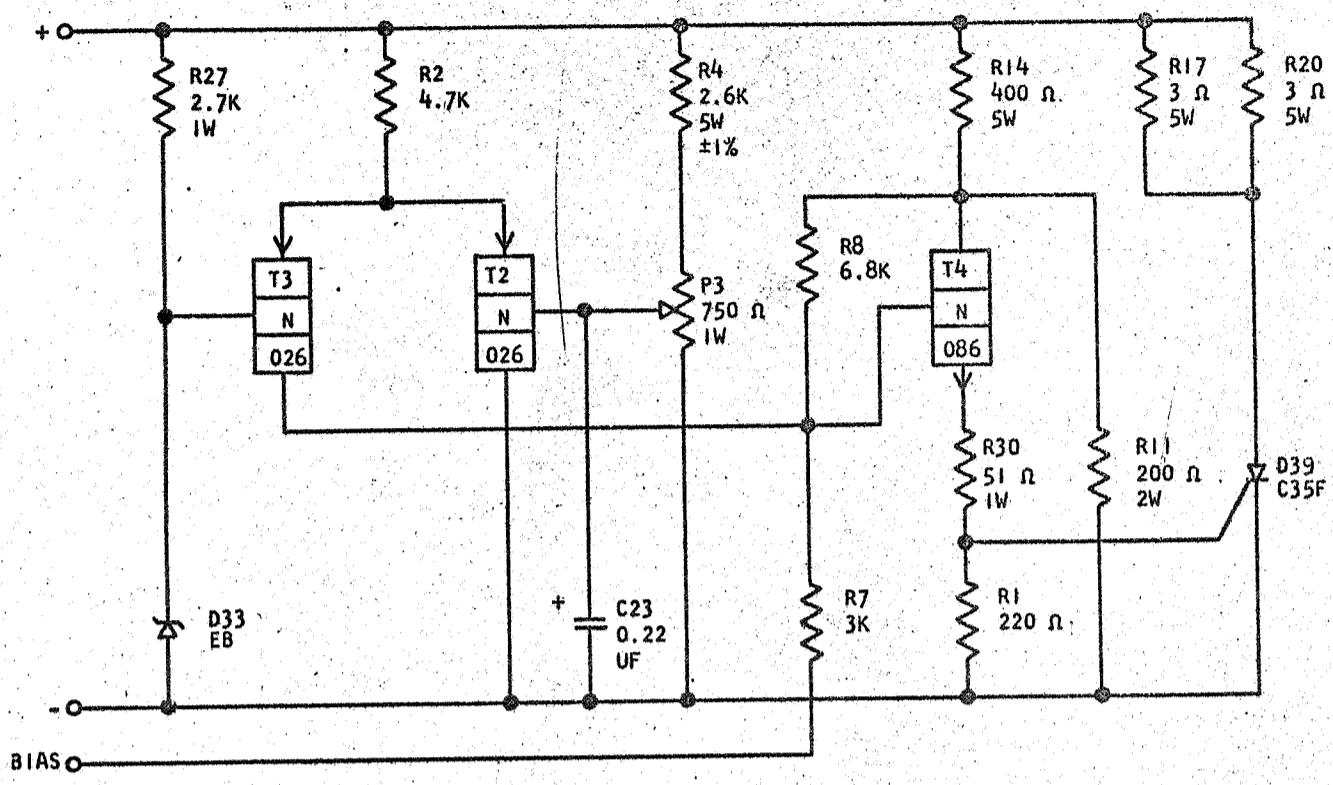
370576

370578

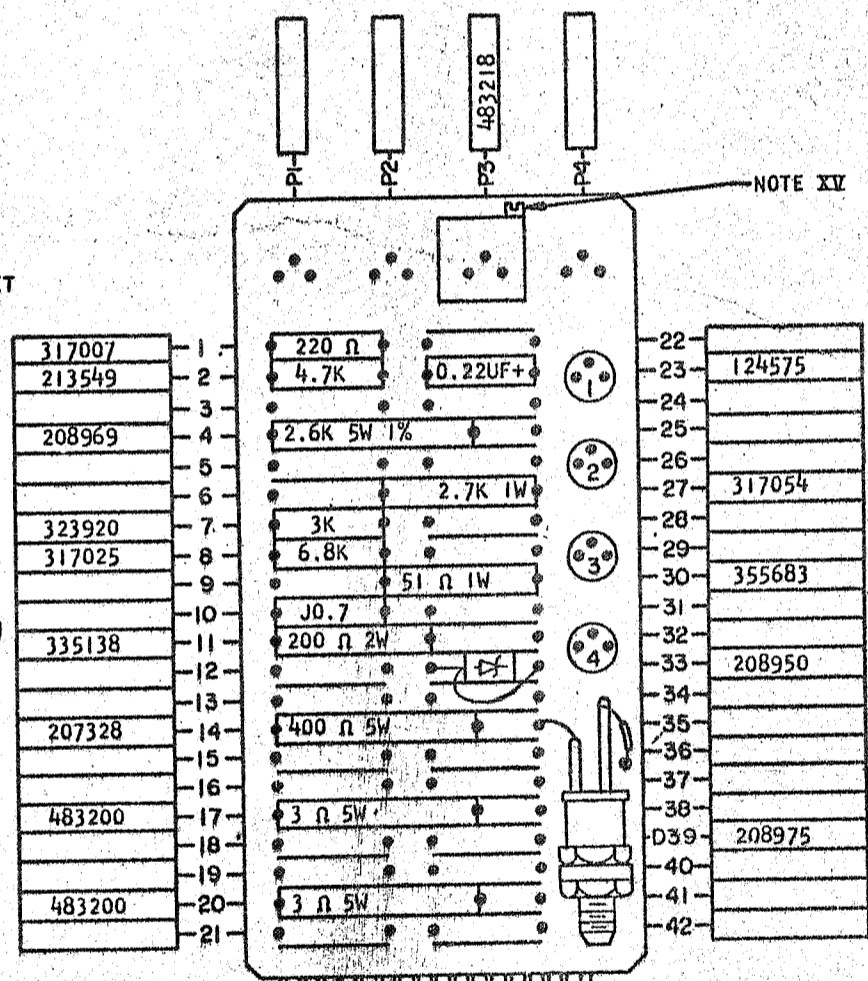
OVERVOLTAGE PROTECTION 30 VOLT

MOUNT CARD ON ONE INCH CENTERS NOTE XIV

370578
STANDARDS CODE
2-7045
Y G D -



- NOTES**
- X** CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 892578
 - XI** ASSEMBLE TO ENGINEERING SPECIFICATION 895396 AND 891999
 - XII** ALL RESISTORS ARE 1/2 WATT AND ±5% UNLESS OTHERWISE NOTED
 - XIII** "J" IN BLOCK DENOTES BARE WIRE JUMPER, 4912 16
 - XIV** MAXIMUM HEIGHT THAT COMPONENTS MAY PROJECT ABOVE THE SURFACE OF THE CARD WILL BE .850
 - XV** EPOXY CEMENT 483002 TO BE APPLIED TO RESISTANCE TRIMMING SCREW AFTER A VOLTAGE SETTING OF 32.4^{+ .100}/_{-.000} VOLTS IS MADE
 - ** **XVI** DIODE 208950 TO BE POSITIONED AS INDICATED
 - ** **XVII** BEND DIODE LEAD NEAREST RED DOT BACK OVER DIODE BODY AS SHOWN
 - XVIII** 483218 AND 208975 MUST NOT BE SUBJECTED TO ANY LIQUIDS



22	124575
23	
24	
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27	317054
28	
29	
30	355683
31	
32	
33	208950
34	
35	
36	
37	
38	
39	D39 208975
40	
41	
42	

T1	535441	026
T2	535441	026
T3	369087	086
T4		
T5		
T6		
T7		

DPD CIRCUIT & PACKAGING STANDARD	
APPROVAL	DATE
JHT	1-24-62
HOLE PATTERN	
493474	

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR - OVER-		SEE INDEX CARD					88-2128
VOLTAGE PROTECTION 30 VOLT	8-30-62	113136					
DESIGN EDF 12-20-61	MODEL SMS						
DETAIL JH 12-29-61	SCALE NONE	9-25-62	113606	MISL			
CHECK EDF 11-5-62	DRAW VE 7-16-62						
APPROD 6W5921-62	CHECK						

370578

370579

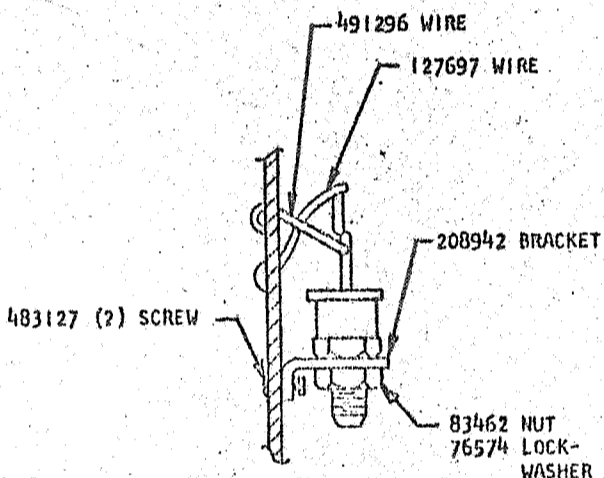
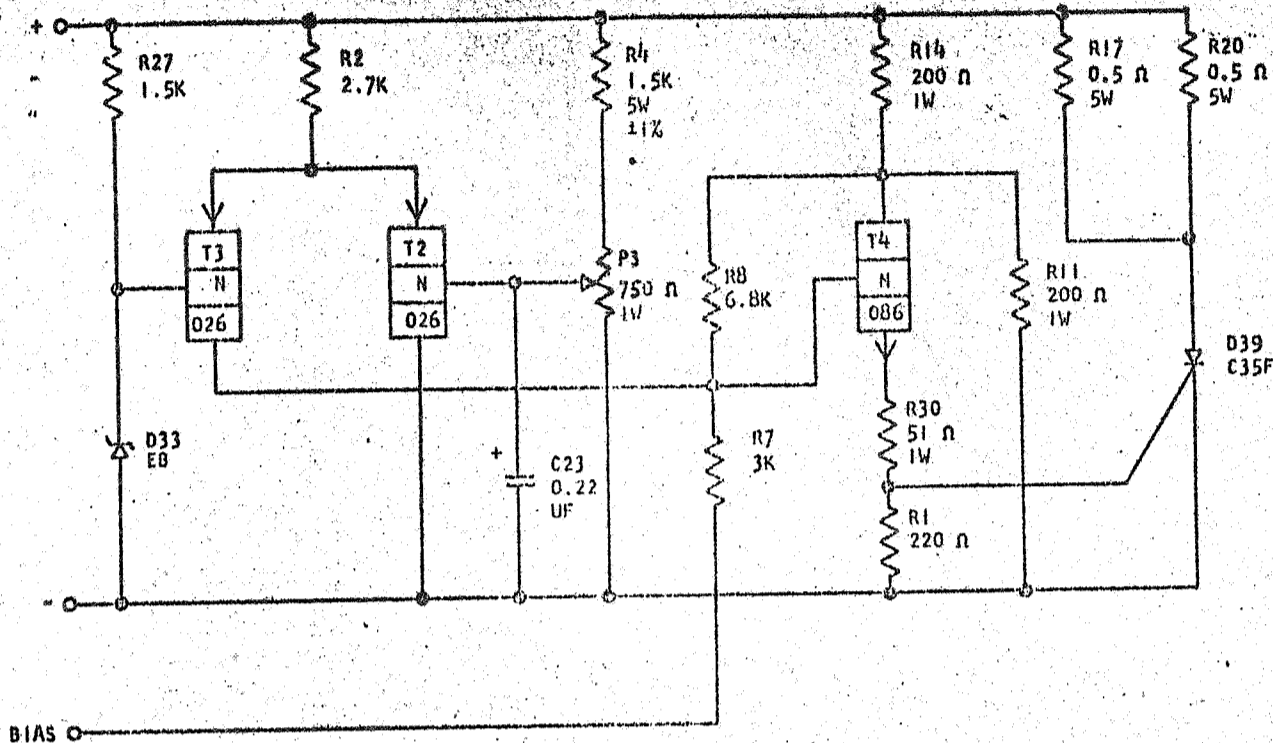
OVERVOLTAGE PROTECTION 20 VOLT
MOUNT CARD ON ONE INCH CENTERS NOTE XIV

370579

Y G E

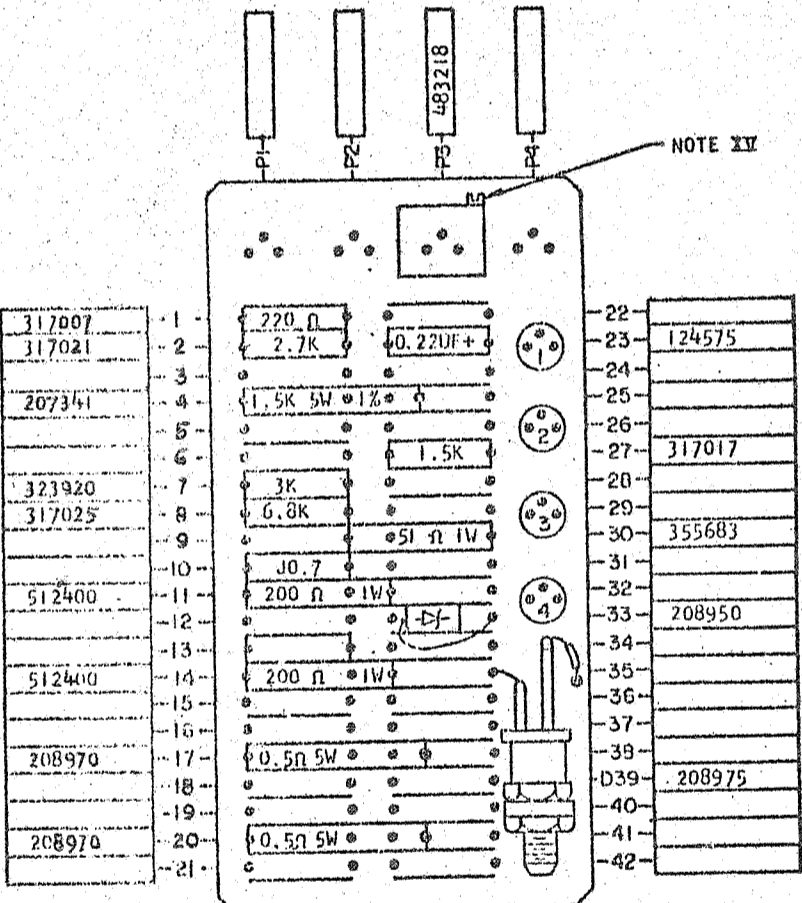
STANDARDS CODE

2-7045



NOTES

- X CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 892579
- XI ASSEMBLE TO ENGINEERING SPECIFICATION 895396 AND 891999
- XII ALL RESISTORS ARE 1/2 WATT AND $\pm 5\%$ UNLESS OTHERWISE NOTED
- XIII "J" IN BLOCK DENOTES BARE WIRE JUMPER, 491296
- XIV MAXIMUM HEIGHT THAT COMPONENTS MAY PROJECT ABOVE THE SURFACE OF THE CARD WILL BE .850
- XV EPOXY CEMENT 483002 TO BE APPLIED TO RESISTANCE TRIMMING SCREW AFTER A VOLTAGE SETTING OF $22.6^{+1.00}_{-.000}$ VOLTS IS MADE
- ** XVI DIODE 208950 TO BE POSITIONED AS INDICATED
- ** XVII BEND DIODE LEAD NEAREST RED DOT BACK OVER DIODE BODY AS SHOWN
- XVIII 483218 AND 208975 MUST NOT BE SUBJECTED TO ANY LIQUIDS



317007	1
317021	2
207341	3
323920	4
317025	5
512400	6
512400	7
208970	8
208970	9
208970	10
208970	11
208970	12
208970	13
208970	14
208970	15
208970	16
208970	17
208970	18
208970	19
208970	20
208970	21

22	
23	124575
24	
25	
26	
27	317017
28	
29	
30	355683
31	
32	
33	208950 **
34	
35	
36	
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39	208975
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41	
42	

T1	535441	026
T2	535441	026
T3	369087	086
T4		
T5		
T6		
T7		

DPD CIRCUIT & PACKAGING STANDARD		HOLE PATTERN		COMPOENT SIDE				370579	
APPROVAL	DATE	483474							
JHT	1-24-62								
INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL		DEVELOPMENT NO.
NAME CARD ASM TSTR-OVER-VOLTAGE PROTECTION 20 VOLT		2-6-62	113685	HDL					88-2127
DESIGN	EDF 12-20-61	MODEL	SMS						
DETAIL	JH 12-29-61	SCALE	NONE						
CHECK	EDF 1-4-62	DRAW	VE 7-16-62						
APPRO	SW 5-2-62	CHECK							

370579

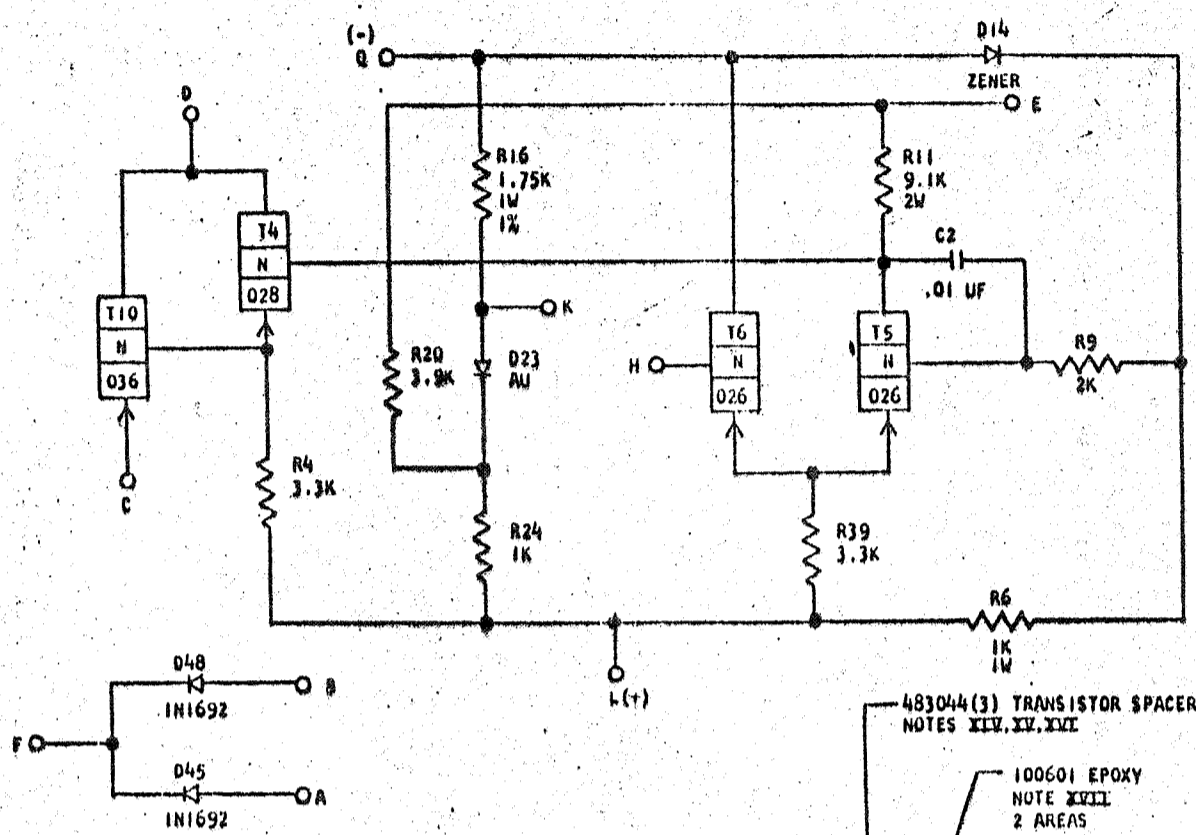
370607

20 VOLT DIFF AMPLIFIER
MOUNT CARD ON ONE-INCH CENTERS - NOTE XIII

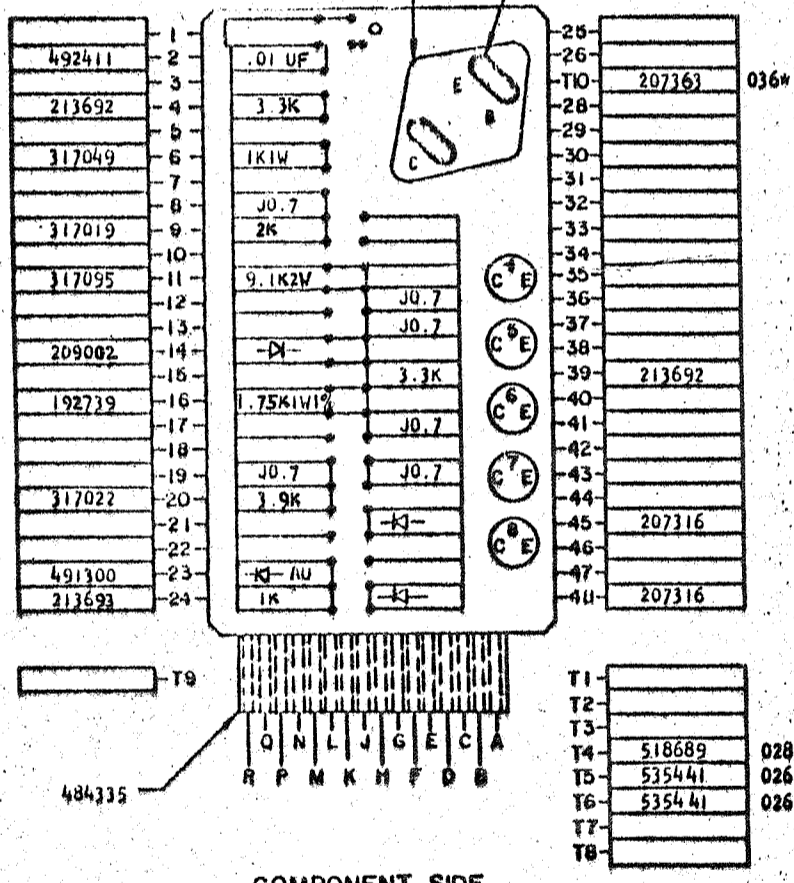
RESTRICTED NOTE XIV

370607

STANDARD CODE
2-7040



- NOTES
- I CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION
 - II ASSEMBLE TO ENGINEERING SPECIFICATION 895396 AND 891999
 - III ALL RESISTORS ARE 1/2 WATT AND ±5% UNLESS OTHERWISE NOTED
 - III "J" IN BLOCK DENOTES BARE WIRE JUMPER, 491296
 - IV TECHNICAL LABORATORY EVALUATION INCOMPLETE. ADDITIONAL USAGE TO BE AVOIDED. THIS PART IS SUBJECT TO WITHDRAWAL.
 - V DO NOT CRIMP TRANSISTOR LEADS. HAND SOLDER TRANSISTOR TO BOARD AFTER CLEANING. MOUNT TRANSISTOR .015 MIN TO .020 MAX ABOVE SURFACE OF CARD. USE SPACER 483044(3) ON TRANSISTOR 207363. PUT TWO BEADS OF 100601 EPOXY ACROSS THE BOTTOM OF 036 TRANSISTOR 207363 AND BAKE AT 125°±5°F FOR 20 MINUTES MIN.
 - VI CUT INSULATING TAPE PART NUMBER 483029 TO A DIA OF .750±.010 AND APPLY TO TOP OF TRANSISTOR 207363
 - VII EPOXY AREAS TO BE 3/16 TO 1/4 INCH WIDE BY APPROXIMATELY .030 HEIGHT BEFORE MOUNTING.
 - VIII MAXIMUM HEIGHT THAT COMPONENTS MAY PROJECT ABOVE SURFACE OF THE CARD WILL BE .405



B

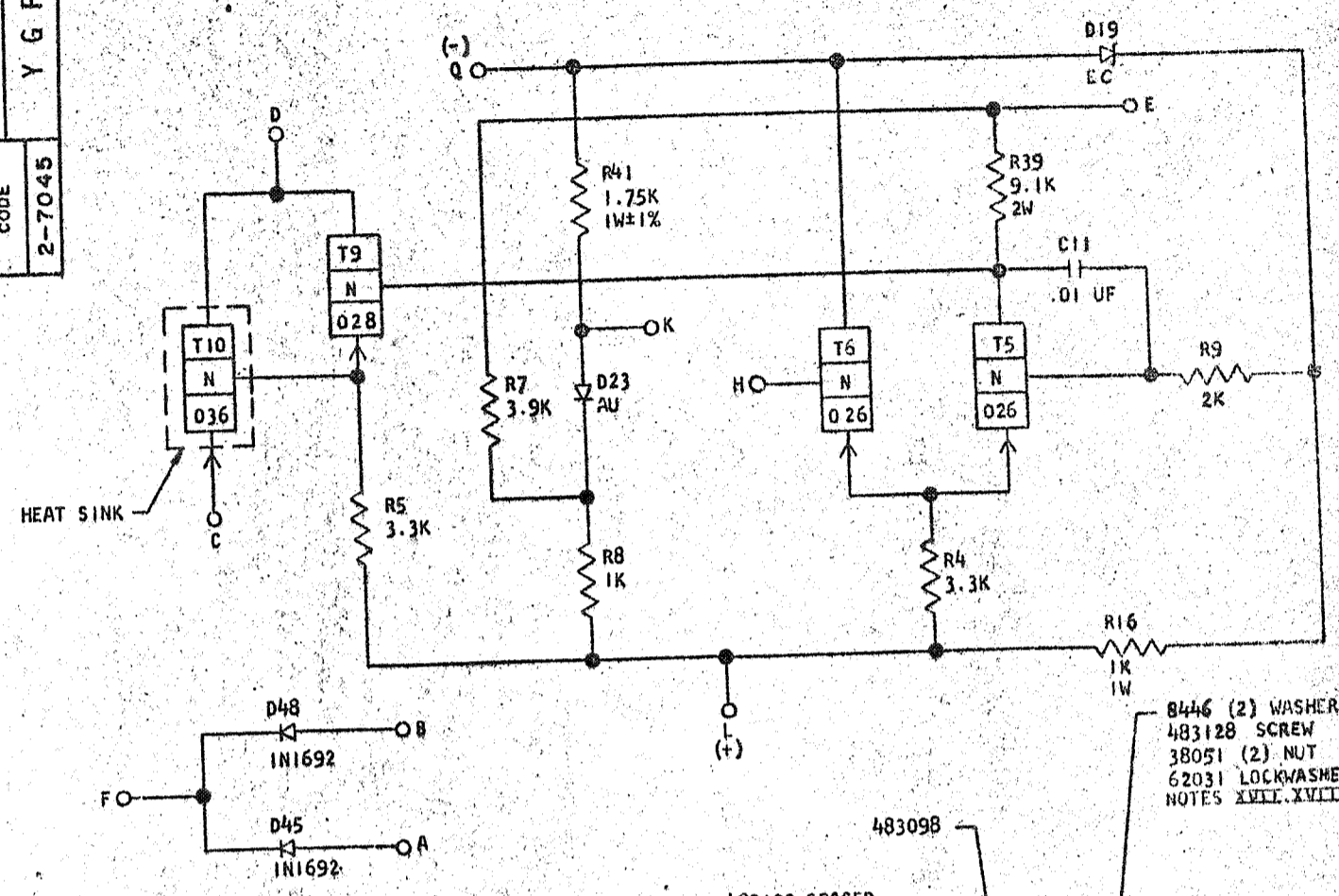
CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE

COMPONENT SIDE

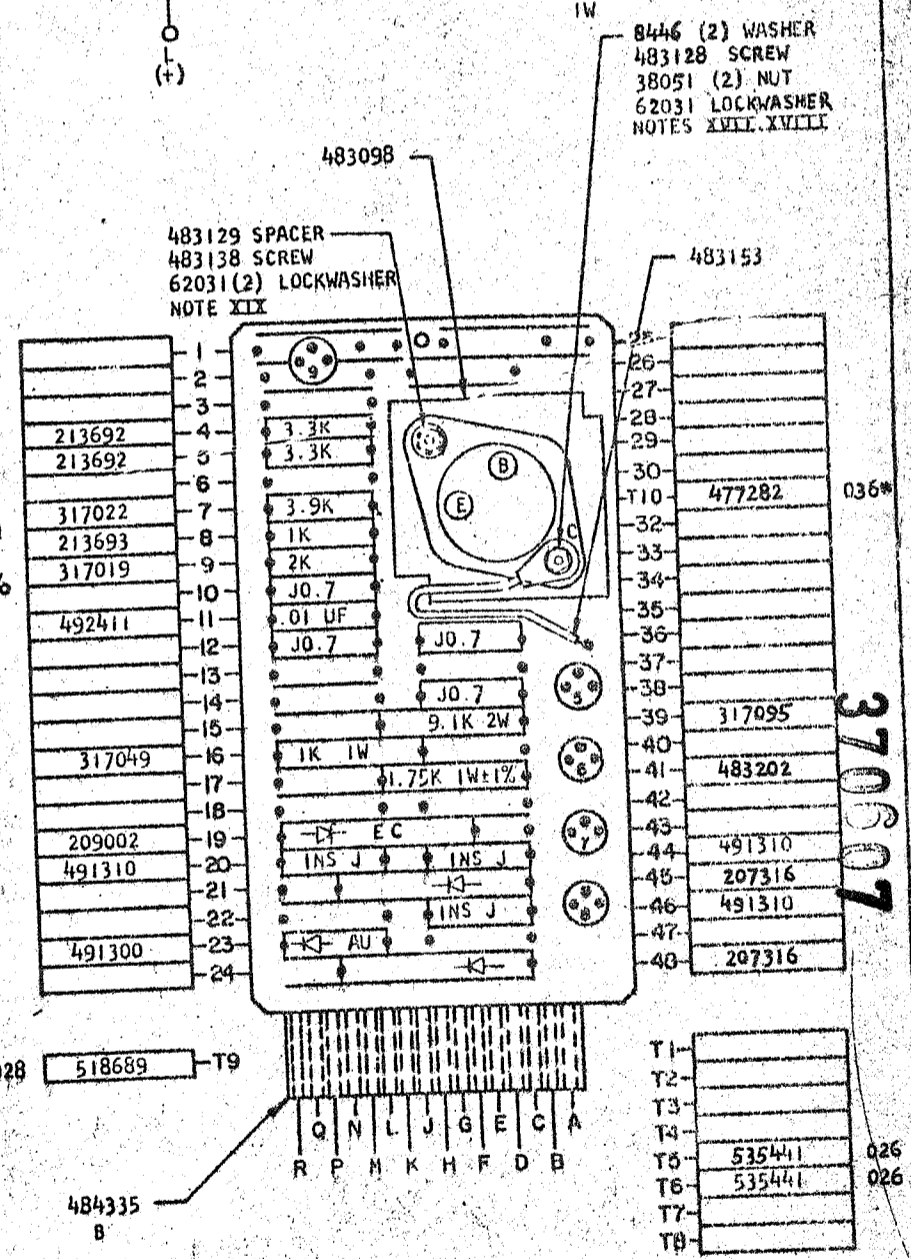
INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME: CARD ASM T5TH-	6-8-61	111822	NOTE XIV				88-2150
DESIGN: RFS 4-19-61							
DETAIL: RFS 4-19-61							
CHECK: RFS 6-7-61							
APPROV: CHS 6-7-61							

20 VOLT DIFF. AMPLIFIER
MOUNT CARD ON ONE-INCH CENTERS - NOTE XVI

370607
RESTRICTED
NOTE XIV



- NOTES
- X CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 892607
 - XI ASSEMBLE TO ENGINEERING SPECIFICATION 898396 AND 891999
 - XII ALL RESISTORS ARE 1/2 WATT AND ± 5% UNLESS OTHERWISE NOTED
 - XIII "J" IN BLOCK DENOTES BARE WIRE JUMPER 491296 UNLESS OTHERWISE NOTED
 - * XIV TECHNICAL LABORATORY EVALUATION INCOMPLETE. ADDITIONAL USAGE TO BE AVOIDED. THIS PART IS SUBJECT TO WITHDRAWAL.
 - XV DO NOT CRIMP TRANSISTOR LEADS.
 - XVI MAXIMUM HEIGHT THAT COMPONENTS MAY PROJECT ABOVE SURFACE OF THE CARD WILL BE .610
 - XVII CASE IS ELECTRICALLY CONNECTED TO COLLECTOR, CONNECTION COMPLETED THROUGH JUMPER.
 - XVIII WASHER 8446 TO BE PLACED BETWEEN HEAT SINK AND CARD SURFACE.
 - XIX PLACE ONE LOCKWASHER 62031 ON EACH SIDE OF NUT



CIRCUIT AND PACKAGING STANDARD		HOLE PATTERN		COMONENT SIDE							
APPROVAL	DATE	493457		T1	T2	T3	T4	T5	T6	T7	T8
J.H. Toloz	1/24/62							535441	026		
INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.				
NAME CARD ASM TSTR - 20 VOLT DIFF. AMPLIFIER	6-8-61	111822	NOTE XIV	8-30-62	113136	NOTE XIV	88-2150				
DESIGN EDF	12-20-61	MODEL SMS									
DETAIL JH	12-29-61	SCALE NONE									
CHECK EDF	1-3-62	DRAW MDE	1-8-62	2-6-62	113685	NOTE XIV					
APPROV WS	2-5-62	CHECK MDE	1-10-62	3-28-62	113967	NOTE XIV					

82-3987-2 6-22-61

370607

370607

370608

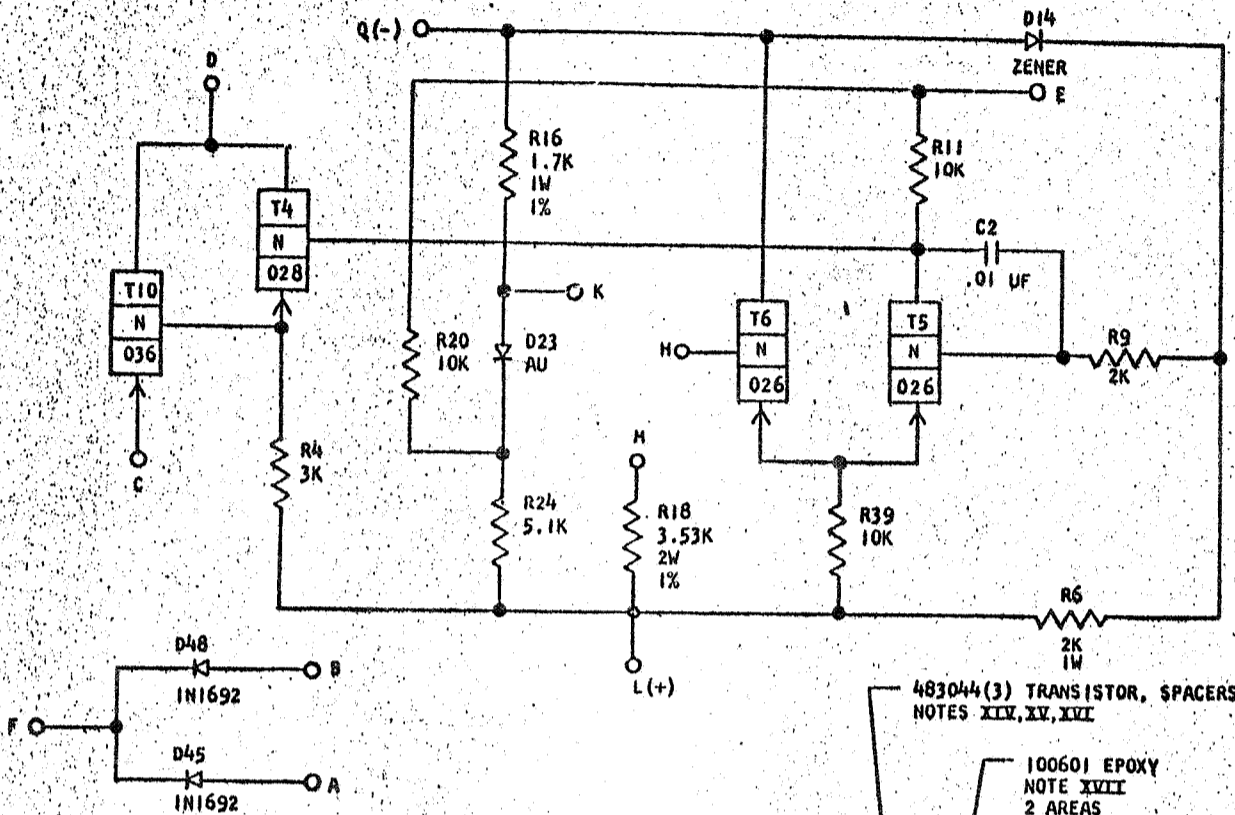
STANDARDS CODE
2-7045

30 VOLT

MOUNT CARD ON ONE-INCH CENTERS - NOTE XVIII

RESTRICTED NOTE XIV

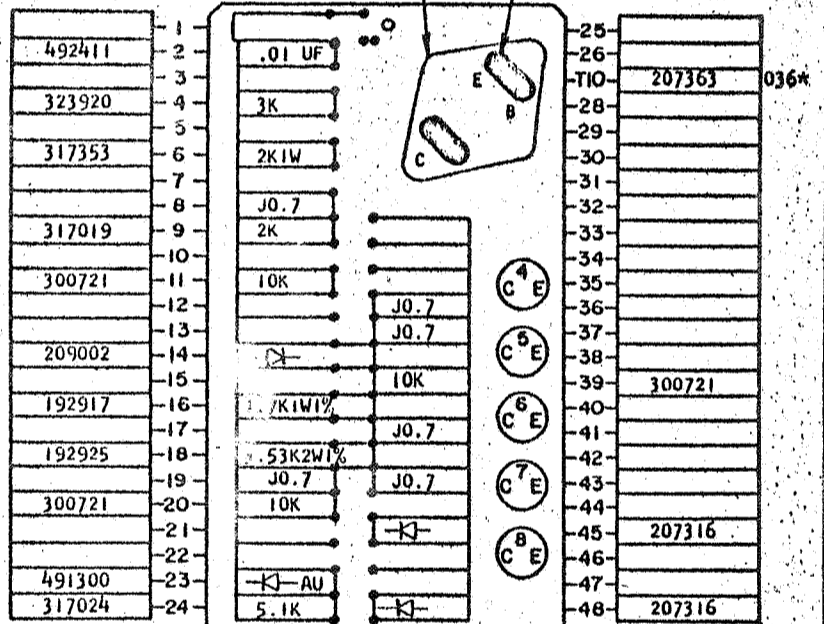
370608



483044(3) TRANSISTOR, SPACERS
NOTES XIV, XV, XVII

100601 EPOXY
NOTE XVII
2 AREAS

- NOTES**
- I** CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION
 - II** ASSEMBLE TO ENGINEERING SPECIFICATION 895396 AND 891999
 - XII** ALL RESISTORS ARE 1/2 WATT AND ±5% UNLESS OTHERWISE NOTED
 - XIII** "J" IN BLOCK DENOTES BARE WIRE JUMPER, 491296
 - XIV** TECHNICAL LABORATORY EVALUATION INCOMPLETE, ADDITIONAL USAGE TO BE AVOIDED. THIS PART IS SUBJECT TO WITHDRAWAL.
 - XV** DO NOT CRIMP TRANSISTOR LEADS, HAND SOLDER TRANSISTOR TO BOARD AFTER CLEANING MOUNT TRANSISTOR .015 MIN TO .020 MAX ABOVE SURFACE OF CARD. USE SPACER 483044(3) ON TRANSISTOR 207363. PUT TWO BEADS OF 100601 EPOXY ACROSS THE BOTTOM OF 036 TRANSISTOR 207363 AND BAKE AT 125°±5°F FOR 20 MINUTES MIN.
 - XVI** CUT INSULATING TAPE PART NUMBER 483029 TO A DIA OF .750±.010 AND APPLY TO TOP OF TRANSISTOR 207363
 - XVII** EPOXY AREAS TO BE 3/16 TO 1/4 INCH WIDE BY APPROXIMATELY .030 HEIGHT BEFORE MOUNTING.
 - XVIII** MAXIMUM HEIGHT THAT COMPONENTS MAY PROJECT ABOVE SURFACE OF THE CARD WILL BE .405



B

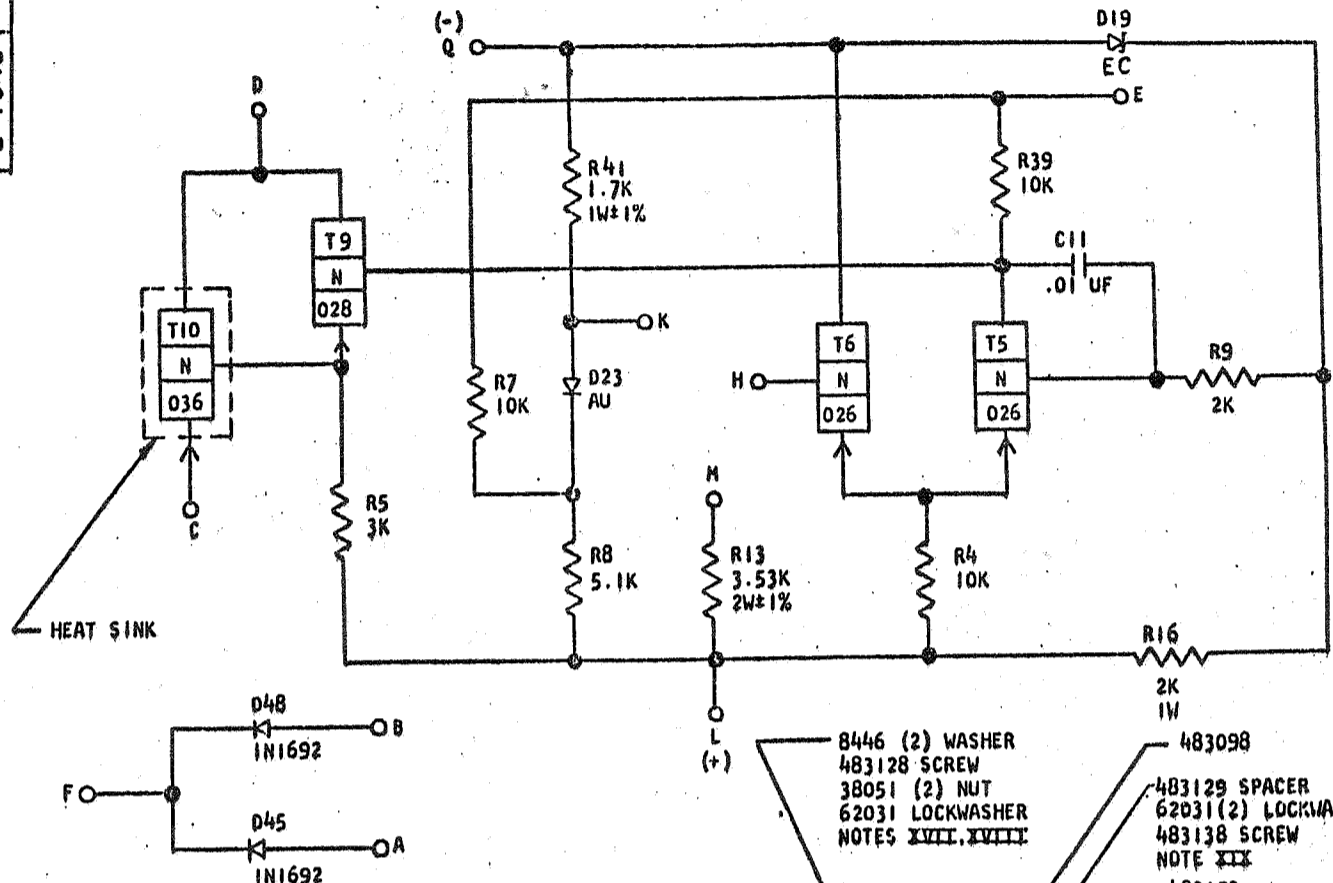
CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE

COMPONENT SIDE

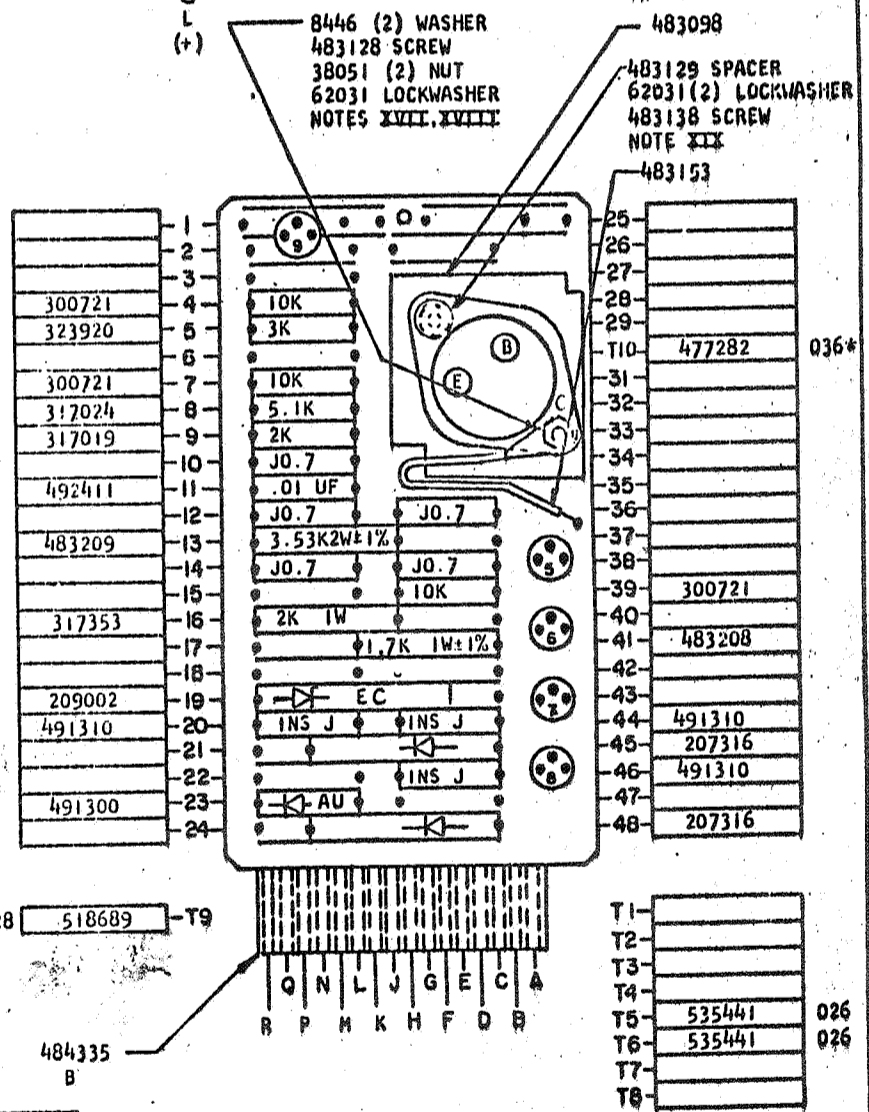
INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD ASM TSTR -	6-8-61	111822	NOTE XIV				88-2151
DESIGN	RFS 4-19-61	TYPE	SMSPWR SUP					
DETAIL	RFS 4-19-61	SCALE	NONE					
CHECK	RFS 6-1-61	DRAW	VE 5-15-61					
APPROV	CHS 6-7-61	CHECK	WDS 5-18-61					

82-3987 11-1-60

370608



- NOTES**
- I CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 892608
 - II ASSEMBLE TO ENGINEERING SPECIFICATION 895396 AND 891999
 - XII ALL RESISTORS ARE 1/2 WATT AND ± 5% UNLESS OTHERWISE NOTED
 - XIII "J" IN BLOCK DENOTES BARE WIRE JUMPER 491296 UNLESS OTHERWISE NOTED
 - * XIV TECHNICAL LABORATORY EVALUATION INCOMPLETE. ADDITIONAL USAGE TO BE AVOIDED. THIS PART IS SUBJECT TO WITHDRAWAL.
 - XV DO NOT CRIMP TRANSISTOR LEADS
 - XVI MAXIMUM HEIGHT THAT COMPONENTS MAY PROJECT ABOVE SURFACE OF THE CARD WILL BE .610.
 - XVII CASE IS ELECTRICALLY CONNECTED TO COLLECTOR, CONNECTION COMPLETED THROUGH JUMPER.
 - XVIII WASHER 8446 TO BE PLACED BETWEEN HEAT SINK AND CARD SURFACE.
 - XIX PLACE ONE LOCKWASHER 62031 ON EACH SIDE OF NUT



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CIRCUIT AND PACKAGING STANDARD		HOLE PATTERN	
APPROVAL	DATE	493457	
JH Toloz.	1/24/62		

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.	370608
NAME CARD ASM TSTR -30 VOLT DIFF. AMPLIFIER	6-8-61	111822	NOTE XIV	8-30-62	113136	NOTE XIV	88-2151	
DESIGN EDF 12-20-61 MODEL S11S	12-1-61	112448	NOTE XIV					
DETAIL JH 12-29-61 SCALE NONE	12-26-61	112448A	NOTE XIV					
CHECK EDF 1-3-62 DRAW MDE 1-8-62	2-6-62	113685	NOTE XIV					
APPRO GWS 2-5-62 CHECK MDE 1-10-62	3-28-62	113967	NOTE XIV					

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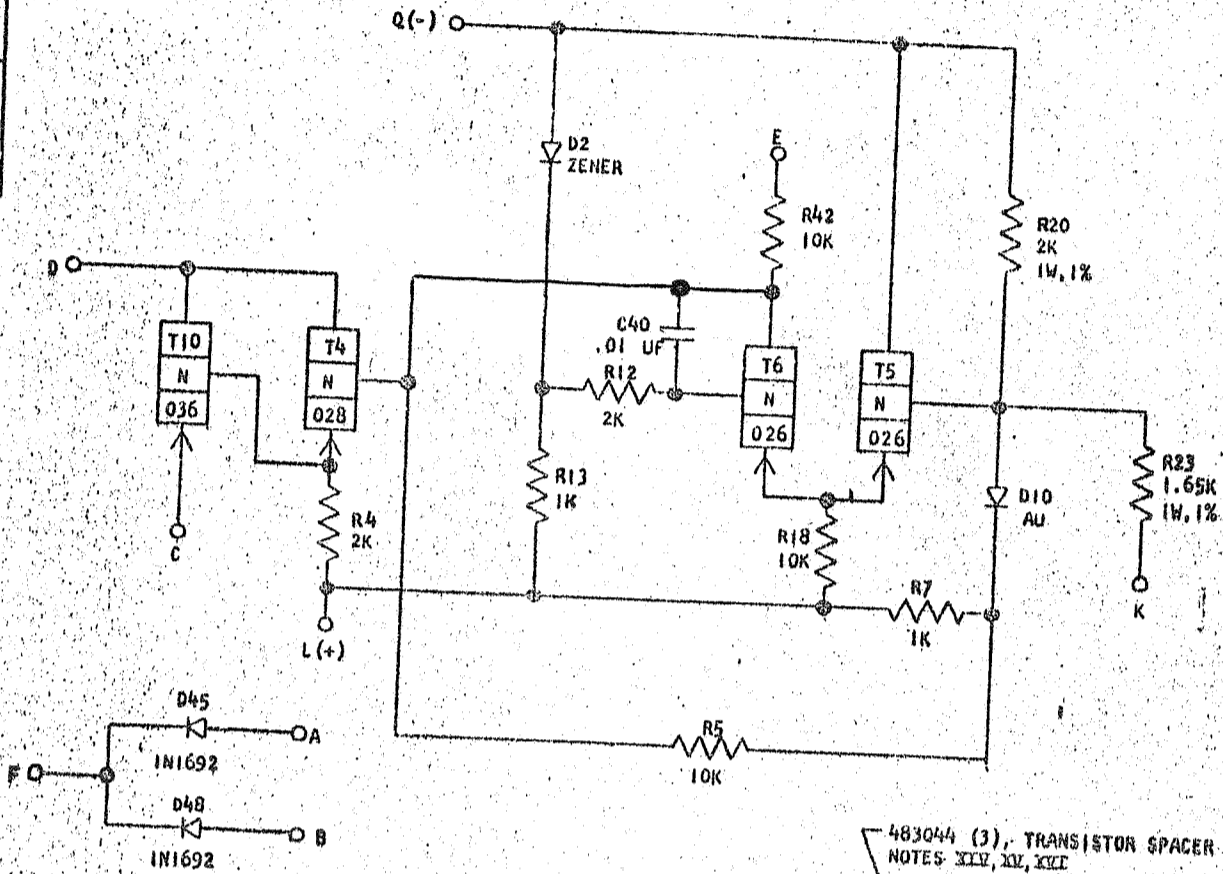
370611

STANDARDS CODE
2-7045

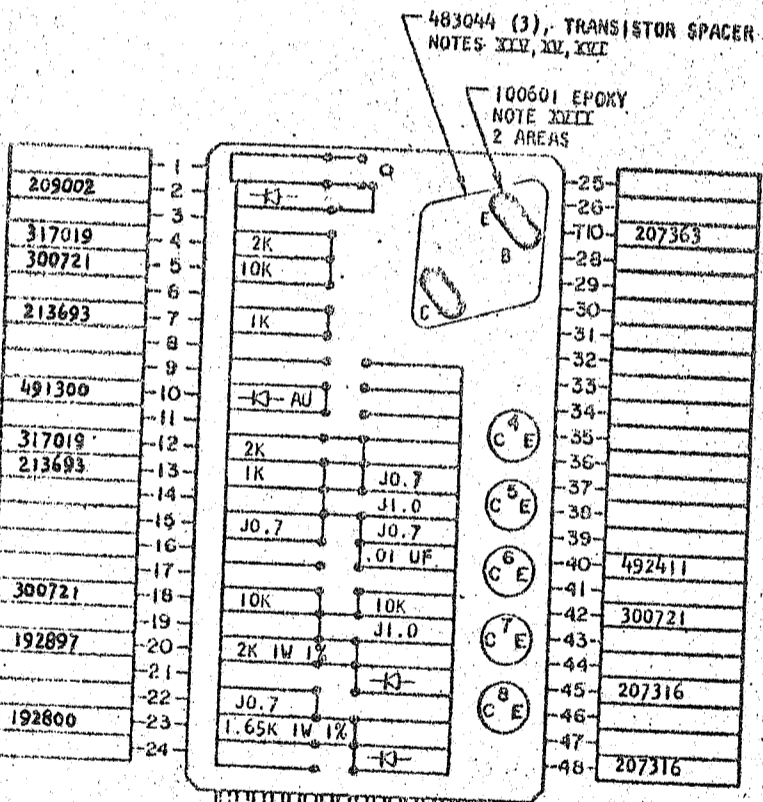
20 VOLT AT 15 AMP DIFF AMPLIFIER
MOUNT CARD ON ONE INCH CENTERS - NOTE XVIII

370611

RESTRICTED NOTE XIV



- NOTES
- X I CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION
 - X II ASSEMBLE TO ENGINEERING SPECIFICATION 895396 AND 891999
 - X III ALL RESISTORS ARE 1/2 WATT AND ±5% UNLESS OTHERWISE NOTED
 - X IV "J" IN BLOCK DENOTES BARE WIRE JUMPER, 491296
 - X V TECHNICAL LABORATORY EVALUATION INCOMPLETE. ADDITIONAL USAGE TO BE AVOIDED. THIS PART IS SUBJECT TO WITHDRAWAL DO NOT CRIMP TRANSISTOR LEADS. HAND SOLDER TRANSISTOR TO BOARD AFTER CLEANING. MOUNT TRANSISTOR .015 MIN TO .020 MAX. ABOVE SURFACE OF CARD. USE SPACER 483044 (3) ON TRANSISTOR 207363. PUT TWO BEADS OF 100601 EPOXY ACROSS THE BOTTOM OF 036 TRANSISTOR 207363 AND BAKE AT 125° ±5°F FOR 20 MINUTES MIN.
 - X VI CUT INSULATING TAPE PART NUMBER 483029 TO A DIA OF .750 ±.010 AND APPLY TO TOP OF TRANSISTOR 207363.
 - X VII EPOXY AREAS TO BE 3/16 TO 1/4 INCH WIDE BY APPROXIMATELY .030 HEIGHT BEFORE MOUNTING.
 - X VIII MAXIMUM HEIGHT THAT COMPONENTS MAY PROJECT ABOVE SURFACE OF THE CARD WILL BE .405.



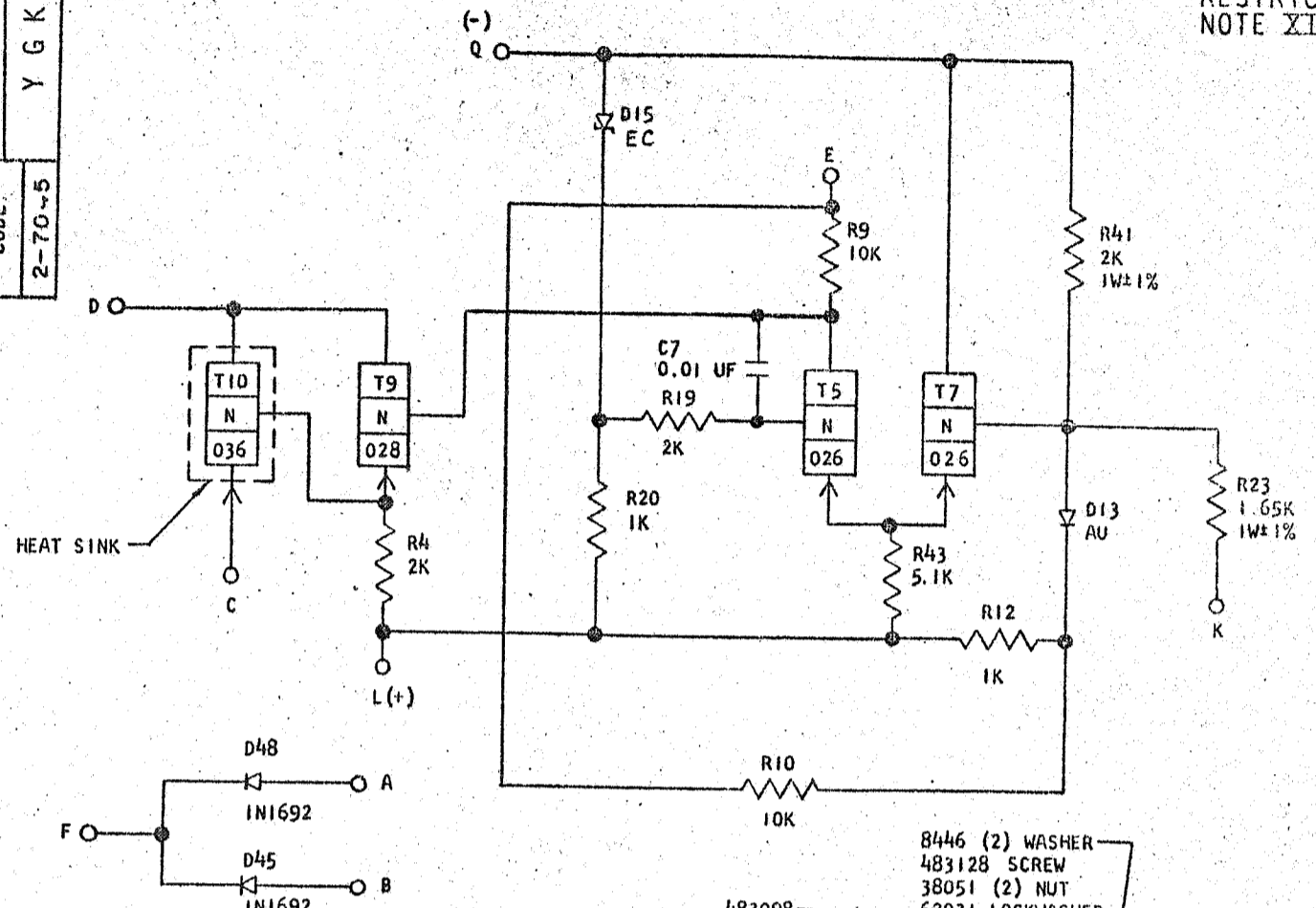
CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE

INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD ASM YSTR-20 VOLT	6-8-61	111822	NOTE XIV				88-2160A
DESIGN	HFS 5-1-61	TYPE	SMS PWR SUP					370611
DETAIL	HFS 5-1-61	SCALE	NONE					
CHECK	VE 6-1-61	DRAW	VE 5-15-61					
APPR	VE 6-7-61	CHECK	VE 5-18-61					

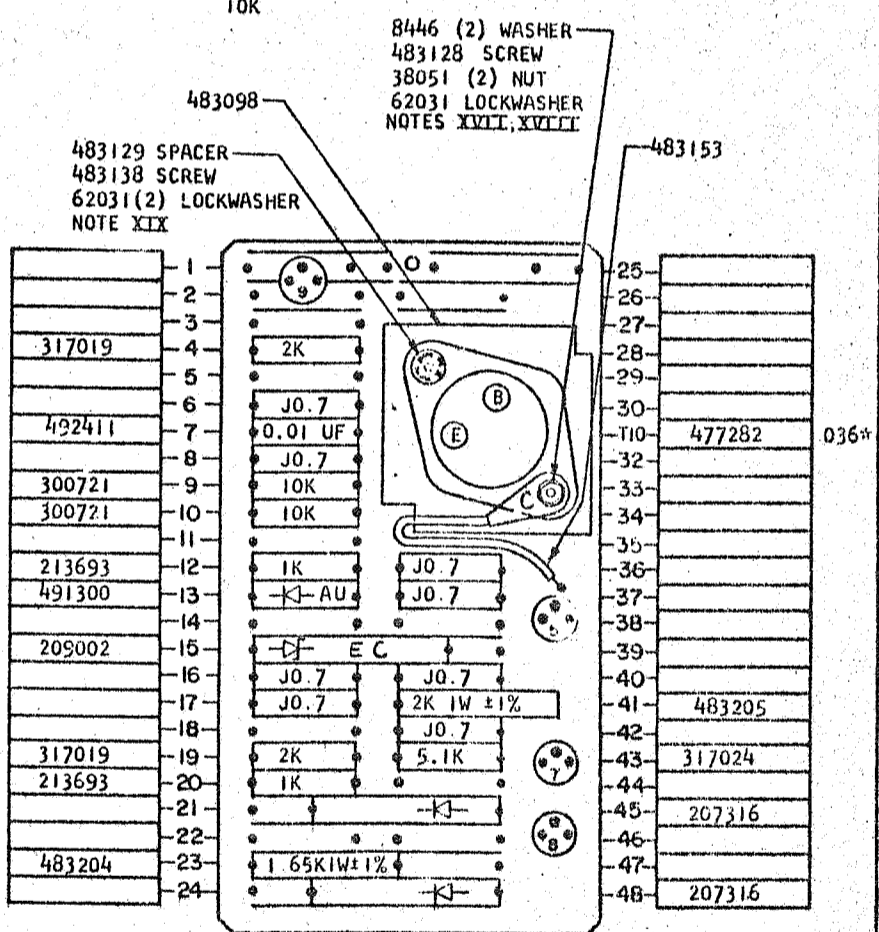
20 VOLT AT 15 AMP DIFF AMPLIFIER
MOUNT CARD ON ONE INCH CENTERS - NOTE XVII

370611
RESTRICTED
NOTE XIV

370611
STANDARDS CODE
2-70-5
Y G K -



- NOTES**
- X CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 892611
 - XI ASSEMBLE TO ENGINEERING SPECIFICATION 895396 AND 891999
 - XII ALL RESISTORS ARE 1/2 WATT AND $\pm 5\%$ UNLESS OTHERWISE NOTED
 - XIII "J" IN BLOCK DENOTES BARE WIRE JUMPER 491296
 - XIV TECHNICAL LABORATORY EVALUATION INCOMPLETE. ADDITIONAL USAGE TO BE AVOIDED. THIS PART IS SUBJECT TO WITHDRAWAL.
 - XV DO NOT CRIMP TRANSISTOR LEADS.
 - XVI MAXIMUM HEIGHT THAT COMPONENTS MAY PROJECT ABOVE SURFACE OF THE CARD WILL BE .610.
 - XVII CASE IS ELECTRICALLY CONNECTED TO COLLECTOR, CONNECTION COMPLETED THROUGH JUMPER.
 - XVIII WASHER 8446 TO BE PLACED BETWEEN HEAT SINK AND CARD SURFACE.
 - XIX PLACE ONE LOCKWASHER 62031 ON EACH SIDE OF NUT



B

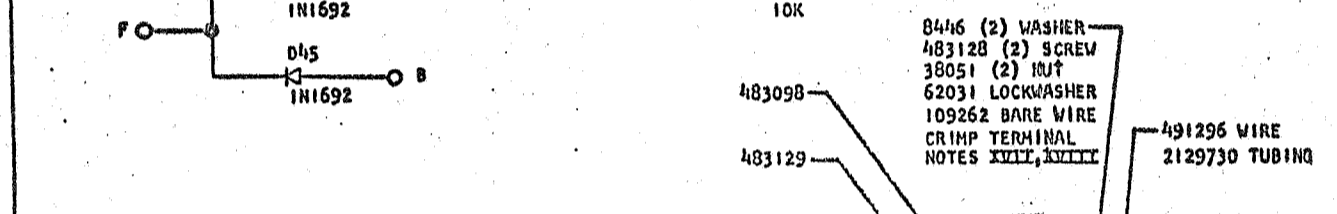
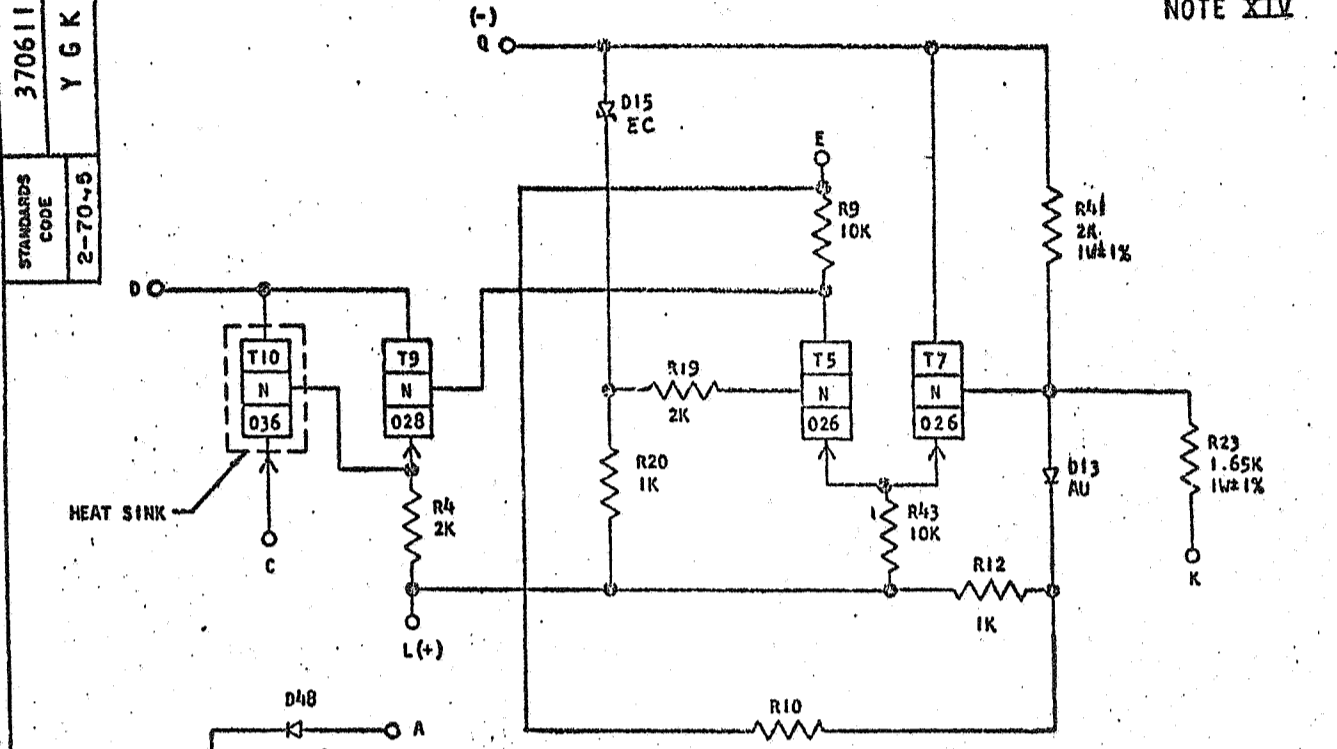
CIRCUIT AND PACKAGING STANDARD		HOLE PATTERN	
APPROVAL	DATE	493457	
J. H. Tokoz		1/24/62	

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME				6-8-61	111822	NOTE XIV	8-30-62	113136	NOTE XIV	88-2160A
CARD ASM TSTR -20 VOLT AT 15 AMP DIFF AMPLIFIER				12-1-61	112448	NOTE XIV				
DESIGN				12-29-61	112448A	NOTE XIV				370611
DETAIL				2-6-62	113685	NOTE XIV				
CHECK				3-28-62	113967	NOTE XIV				
APPRO										

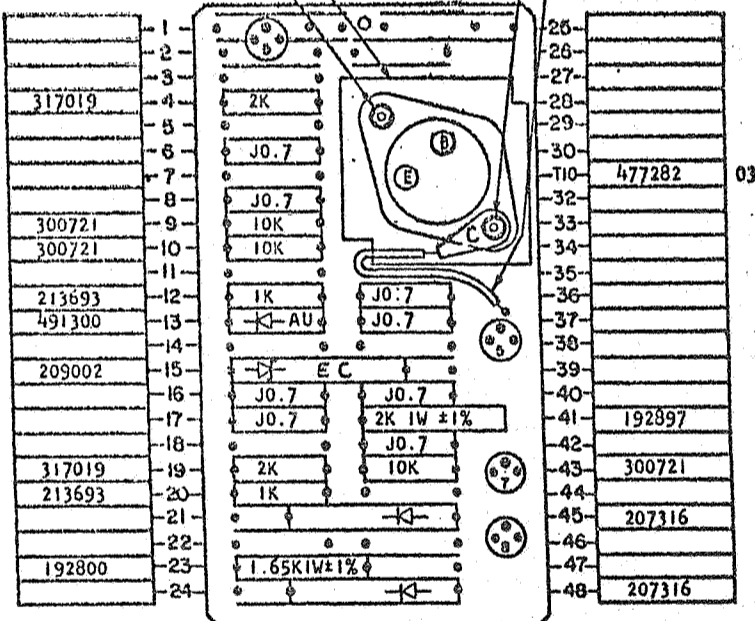
62-3987-2 6-22-61

20 VOLT AT 15 AMP DIFF AMPLIFIER
MOUNT CARD ON ONE INCH CENTERS - NOTE XIII

370611
RESTRICTED
NOTE XIV



- NOTES
- X CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 892611
 - XI ASSEMBLE TO ENGINEERING SPECIFICATION 895396 AND 891999, 890130.
 - XII ALL RESISTORS ARE 1/2 WATT AND $\pm 5\%$ UNLESS OTHERWISE NOTED
 - XIII "J" IN BLOCK DENOTES BARE WIRE JUMPER 491296
 - XIV TECHNICAL LABORATORY EVALUATION INCOMPLETE. ADDITIONAL USAGE TO BE AVOIDED. THIS PART IS SUBJECT TO WITHDRAWAL.
 - XV DO NOT CRIMP TRANSISTOR LEADS.
 - XVI MAXIMUM HEIGHT THAT COMPONENTS MAY PROJECT ABOVE SURFACE OF THE CARD WILL BE .610.
 - XVII CASE IS ELECTRICALLY CONNECTED TO COLLECTOR, CONNECTION COMPLETED THROUGH JUMPER.
 - XVIII WASHER 8446 TO BE PLACED BETWEEN HEAT SINK AND CARD SURFACE.



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
<i>J.H. Tolson</i>	1/24/62

HOLE PATTERN
493457

COMPONENT SIDE

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR -20 VOLT AT 15 AMP DIFF AMPLIFIER	6-8-61	111822	NOTE XIV				88-2160A
DESIGN EDF 12-20-61 MODEL SMS	12-1-61	112448	NOTE XIV				
DETAIL JH 12-29-61 SCALE NONE	12-26-61	112448A	NOTE XIV				
CHECK EDF 1-4-62 DRAW MDE 1-9-62	2-6-62	113695	NOTE XIV				
APPRO GWS 2-5-62 CHECK WBS 1-10-62							

82-3987-2 6-22-61

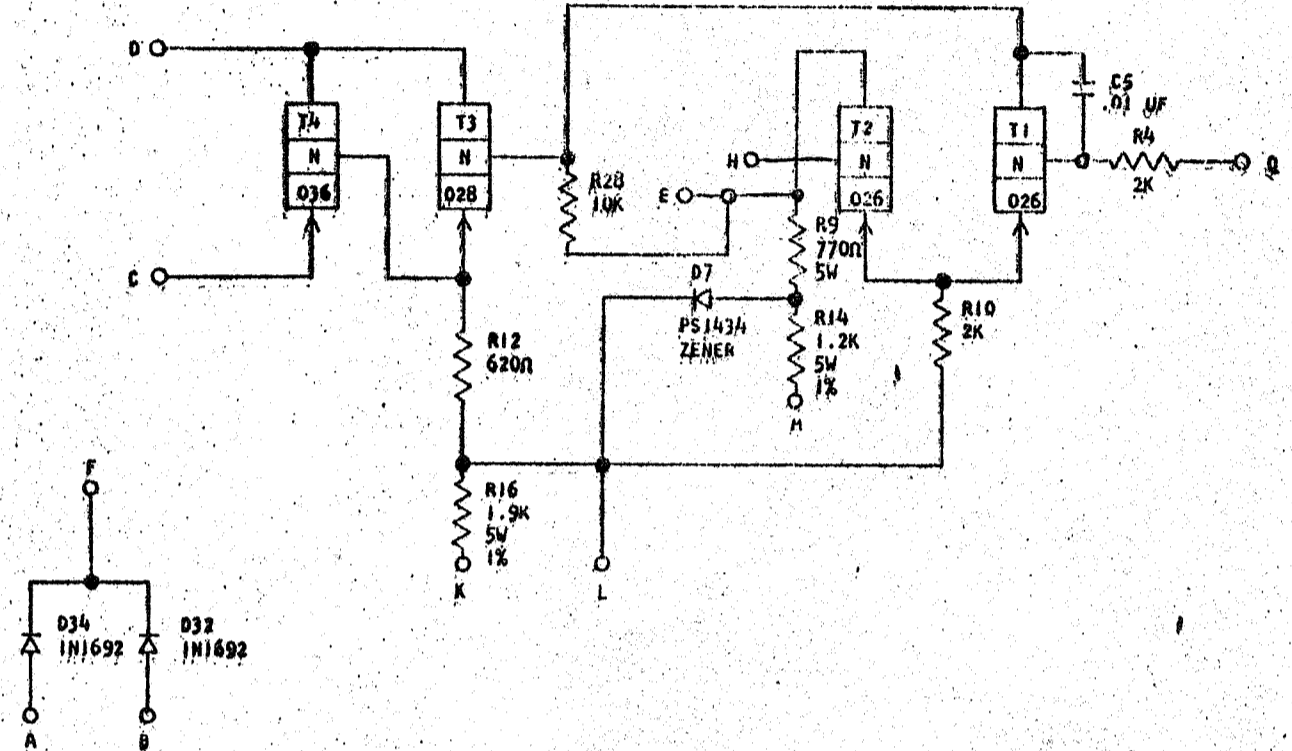
370611

6 VOLT DIFF AMPLIFIER
 MOUNT CARD ON ONE INCH CENTERS - NOTE XVII

370612

RESTRICTED NOTE XIV

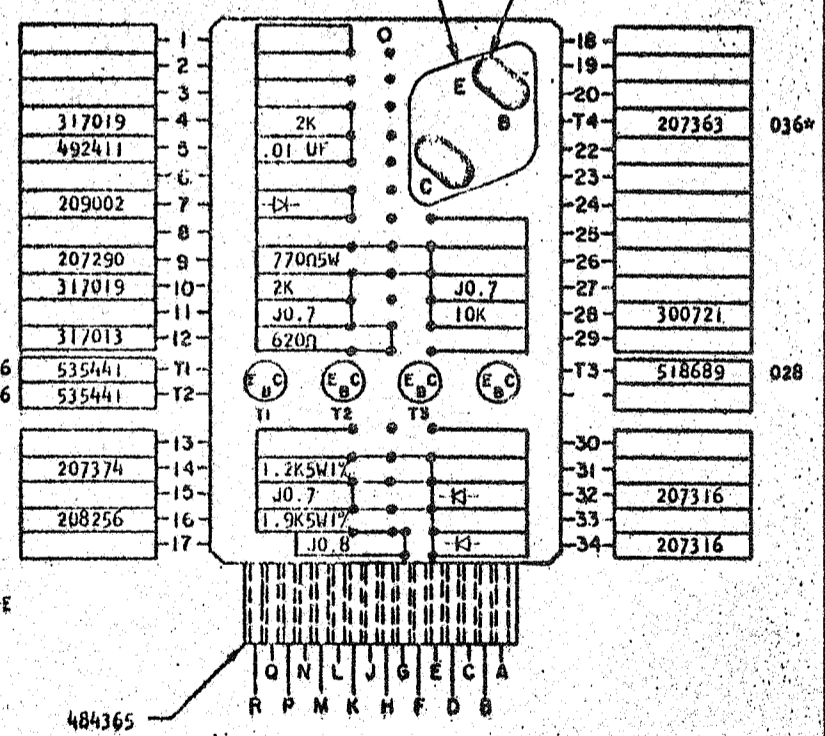
370612
 STANDARDS
 CODE
 2-7045



- NOTES
- I CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION
 - II ASSEMBLE TO ENGINEERING SPECIFICATION 895396 AND 891999
 - III ALL RESISTORS ARE 1/2 WATT AND ±5% UNLESS OTHERWISE NOTED
 - III "J" IN BLOCK DENOTES BARE WIRE JUMPER, 491296
 - IV TECHNICAL LABORATORY EVALUATION INCOMPLETE. ADDITIONAL USAGE TO BE AVOIDED. THIS PART SUBJECT TO WITHDRAWAL.
 - V DO NOT CRIMP TRANSISTOR LEADS. HAND SOLDER TRANSISTOR TO BOARD AFTER CLEANING. MOUNT TRANSISTOR .015 MIN TO .020 MAX ABOVE SURFACE OF CARD. USE SPACER 483044(3) ON TRANSISTOR 207363. PUT TWO BEADS OF 100601 EPOXY ACROSS THE BOTTOM OF 036 TRANSISTOR 207363 AND BAKE AT 125±5°F FOR 20 MINUTES MIN.
 - VI CUT INSULATING TAPE PART NUMBER 483029 TO A DIA OF .750±.010 AND APPLY TO TOP OF TRANSISTOR 207363
 - VII EPOXY AREAS TO BE 3/16 TO 1/4 INCH WIDE BY APPROXIMATELY .030 HEIGHT BEFORE MOUNTING.
 - VIII MAX HEIGHT THAT COMPONENTS MAY PROJECT ABOVE SURFACE OF CARD WILL BE .405

483044(3) TRANSISTOR SPACER
 NOTES XII, XV, XVI

100601 EPOXY
 NOTE XVII
 2 AREAS



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR- 6 VOLT	6-8-61	111822	NOTE XIV				88-2149
DIFF AMPLIFIER							
DESIGN	TYPE	SMS	PWR	SUP			
DETAIL JFM	4-11-61	SCALE	NONE				
CHECK CWS	4-14-61	DRAW	VE	5-15-61			
APPRO CHS	6-7-61	CHECK	JAD	5-18-61			

370612

370612

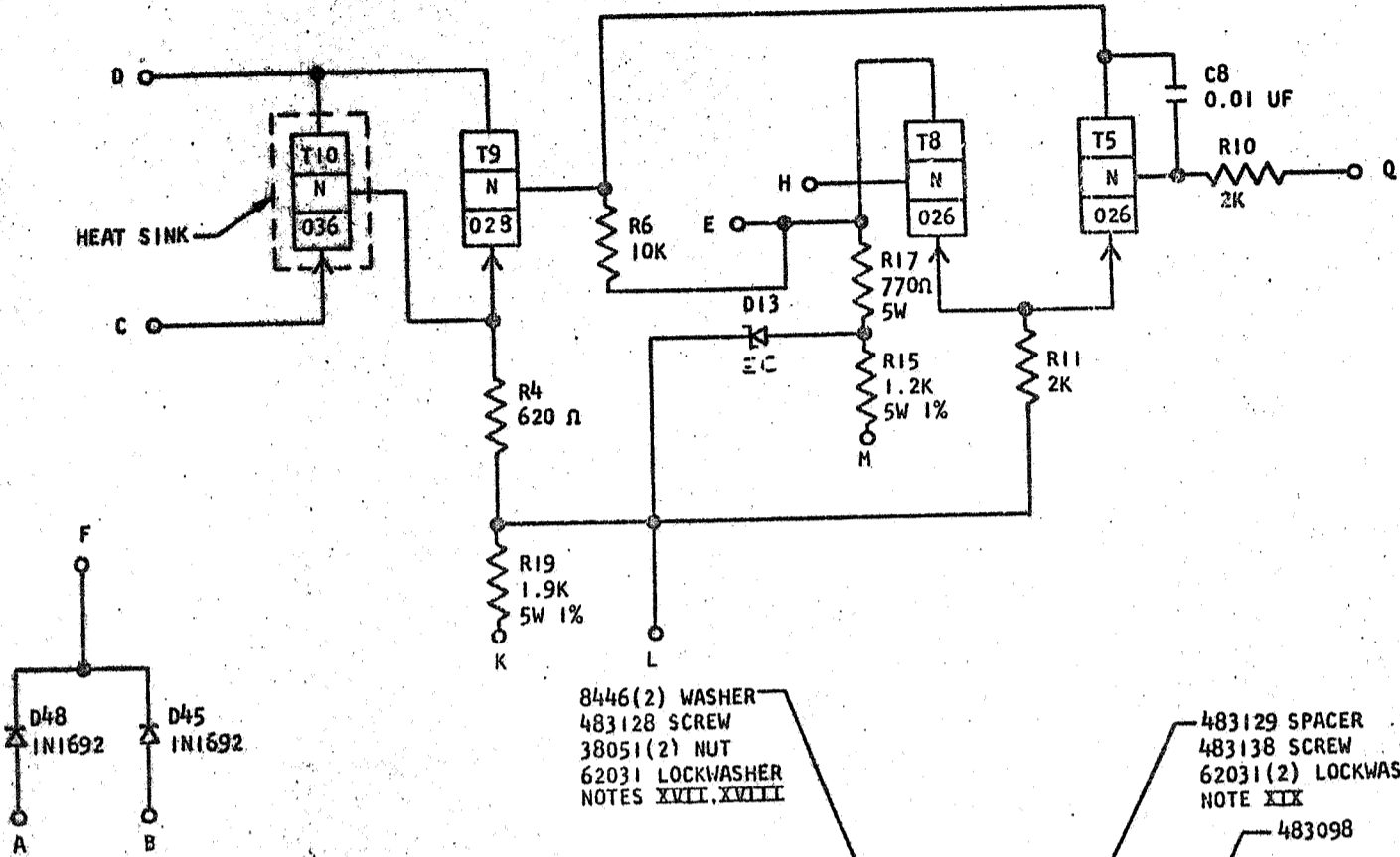
YGL -

STANDARDS CODE
2-7045

6 VOLT DIFF AMPLIFIER
MOUNT CARD ON ONE INCH CENTERS - NOTE XVI

RESTRICTED NOTE XIV

370612

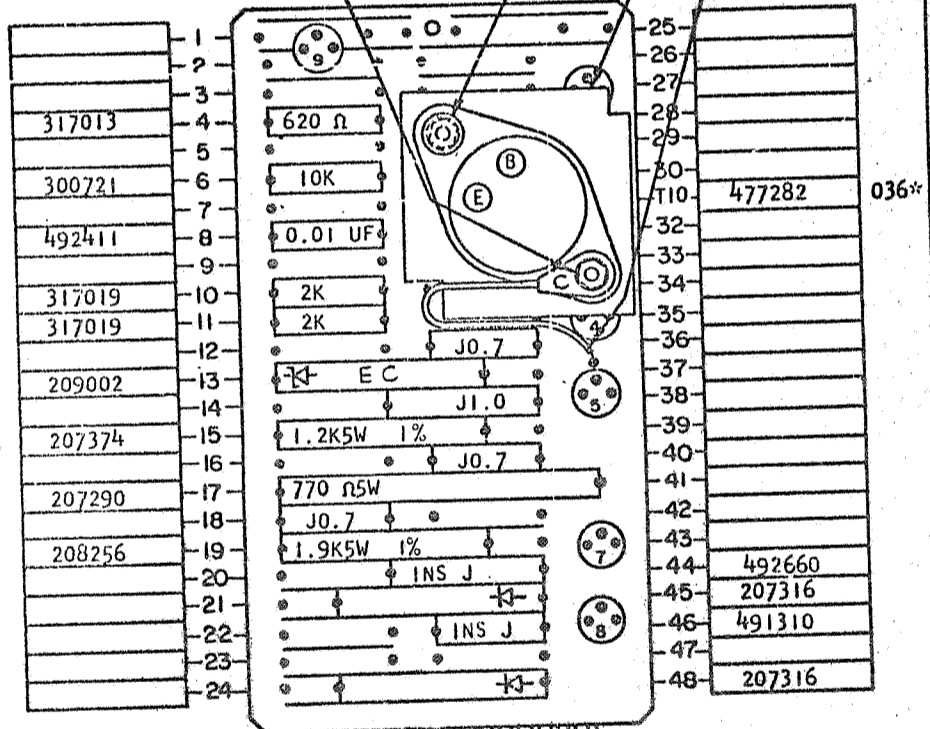


8446(2) WASHER
483128 SCREW
38051(2) NUT
62031 LOCKWASHER
NOTES XVII, XVIII

483129 SPACER
483138 SCREW
62031(2) LOCKWASHER
NOTE XIX

NOTES

- X CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 892612
- XI ASSEMBLE TO ENGINEERING SPECIFICATION 895396, 891999
- XII ALL RESISTORS ARE 1/2 WATT AND $\pm 5\%$ UNLESS OTHERWISE NOTED
- XIII "J" IN BLOCK DENOTES BARE WIRE
- XIV JUMPER 491296 UNLESS OTHERWISE NOTED
- XV TECHNICAL LABORATORY EVALUATION INCOMPLETE. ADDITIONAL USAGE TO BE AVOIDED. THIS PART SUBJECT TO WITHDRAWAL.
- XVI DO NOT CRIMP TRANSISTOR LEADS. MAX HEIGHT THAT COMPONENTS MAY PROJECT ABOVE SURFACE OF CARD WILL BE .610
- XVII CASE IS ELECTRICALLY CONNECTED TO COLLECTOR, CONNECTION COMPLETED THROUGH JUMPER
- XVIII WASHER 8446 TO BE PLACED BETWEEN HEAT SINK AND CARD SURFACE
- XIX PLACE ONE LOCKWASHER 62031 ON EACH SIDE OF NUT



B

CIRCUIT AND PACKAGING STANDARD		HOLE PATTERN	
APPROVAL	DATE	493457	
JH Tol200	1/24/62		

COMPONENT SIDE

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR - 6 VOLT	6-8-61	111822	NOTE XIV				88-2149
DIFF AMPLIFIER	12-1-61	112448	NOTE XIV				
DESIGN EDF 12-20-61	12-26-61	112448A	NOTE XIV				
DETAIL JH 12-29-61	2-6-62	113685	NOTE XIV				
CHECK EDF 1-4-62	3-28-62	113967	NOTE XIV				
APPRO GWS 2-5-62							370612

82-3987-2 6-22-61

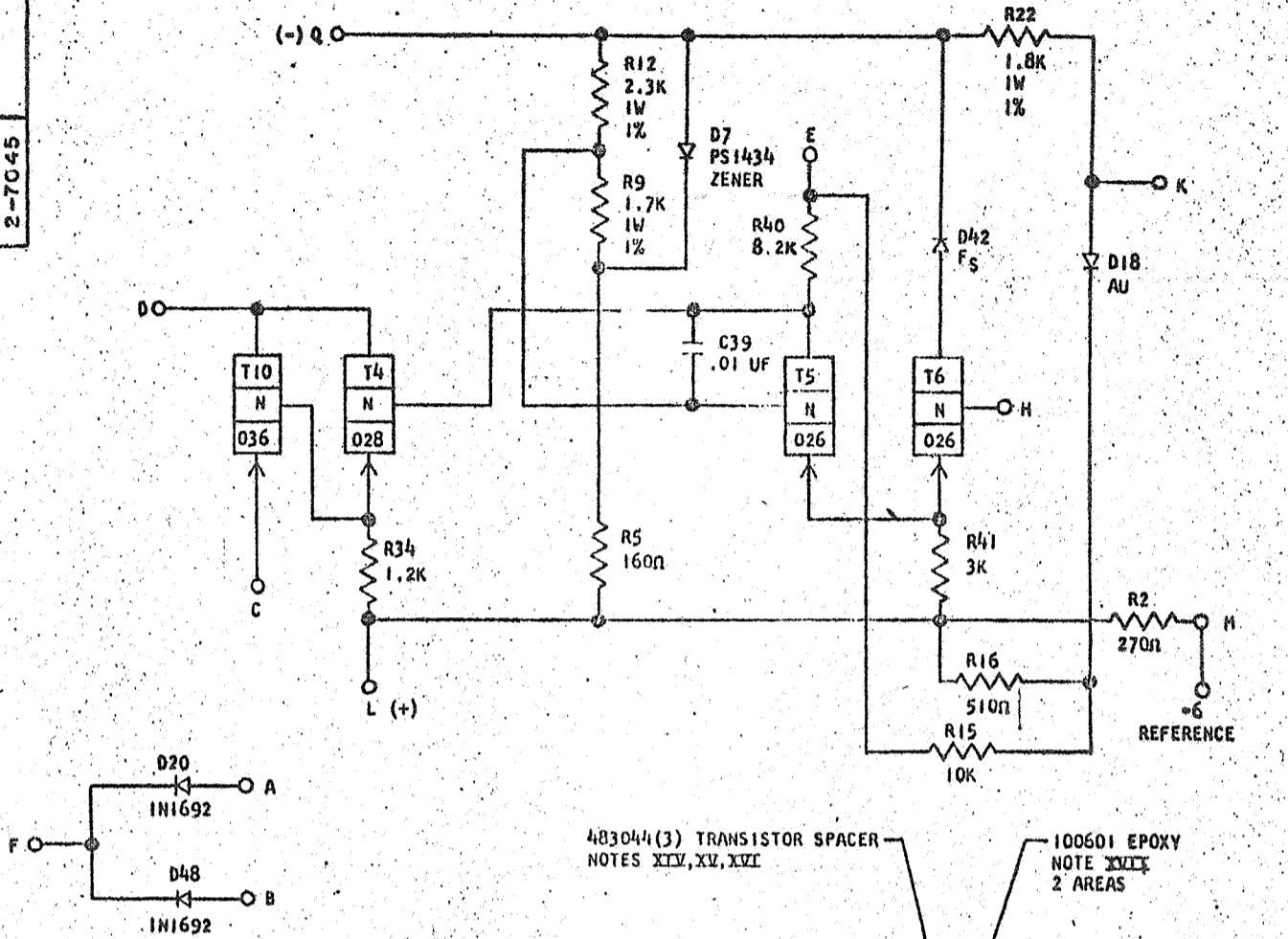
370613

REFERENCE TO -6 VOLTS

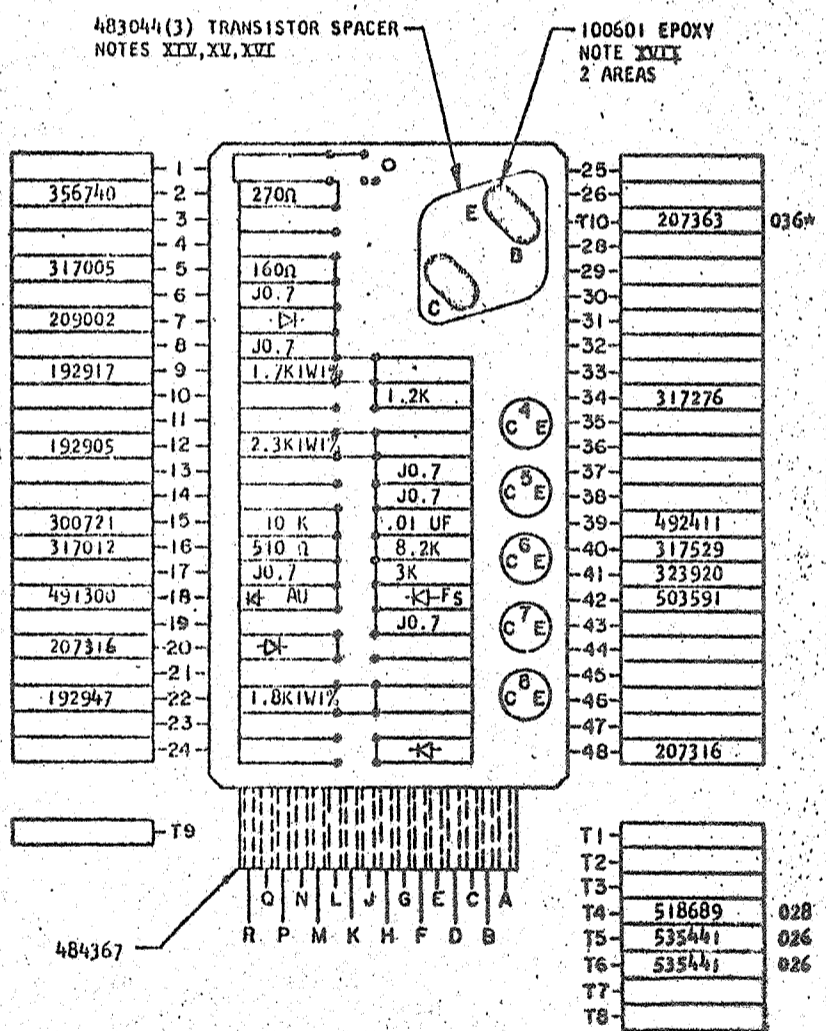
MOUNT CARD ON ONE INCH CENTERS - NOTE XLIII

RESTRICTED NOTE XIV

370613
STANDARDS
CODE
2-7045



- NOTES**
- X CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION
 - XI ASSEMBLE TO ENGINEERING SPECIFICATION 895396 AND 891999
 - XII ALL RESISTORS ARE 1/2 WATT AND ±5% UNLESS OTHERWISE NOTED.
 - XIII "JM" IN BLOCK DENOTES BARE WIRE JUMPER, 491296
 - XIV TECHNICAL LABORATORY EVALUATION INCOMPLETE. ADDITIONAL USAGE TO BE AVOIDED. THIS PART IS SUBJECT TO WITHDRAWAL
 - XV DO NOT CRIMP TRANSISTOR LEADS. HAND SOLDER TRANSISTOR TO BOARD AFTER CLEANING. MOUNT TRANSISTOR .015 MIN TO .020 MAX ABOVE SURFACE OF CARD. USE SPACER 483044(3) ON TRANSISTOR 207363. PUT TWO BEADS OF 100501 EPOXY ACROSS THE BOTTOM OF 036 TRANSISTOR 207363 AND BAKE AT 125°±5°F FOR 20 MINUTES MIN
 - XVI CUT INSULATING TAPE PART NUMBER 483029 TO A DIA OF .750±.010 AND APPLY TO TOP OF TRANSISTOR 207363
 - XVII EPOXY AREAS TO BE 3/16 TO 1/4 INCH WIDE BY APPROXIMATELY .030 HEIGHT BEFORE MOUNTING
 - XVIII MAXIMUM HEIGHT THAT COMPONENTS MAY PROJECT ABOVE SURFACE OF THE CARD WILL BE .405



CIRCUIT AND PACKAGING STANDARDS	
APPROVAL	DATE

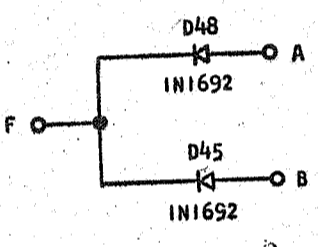
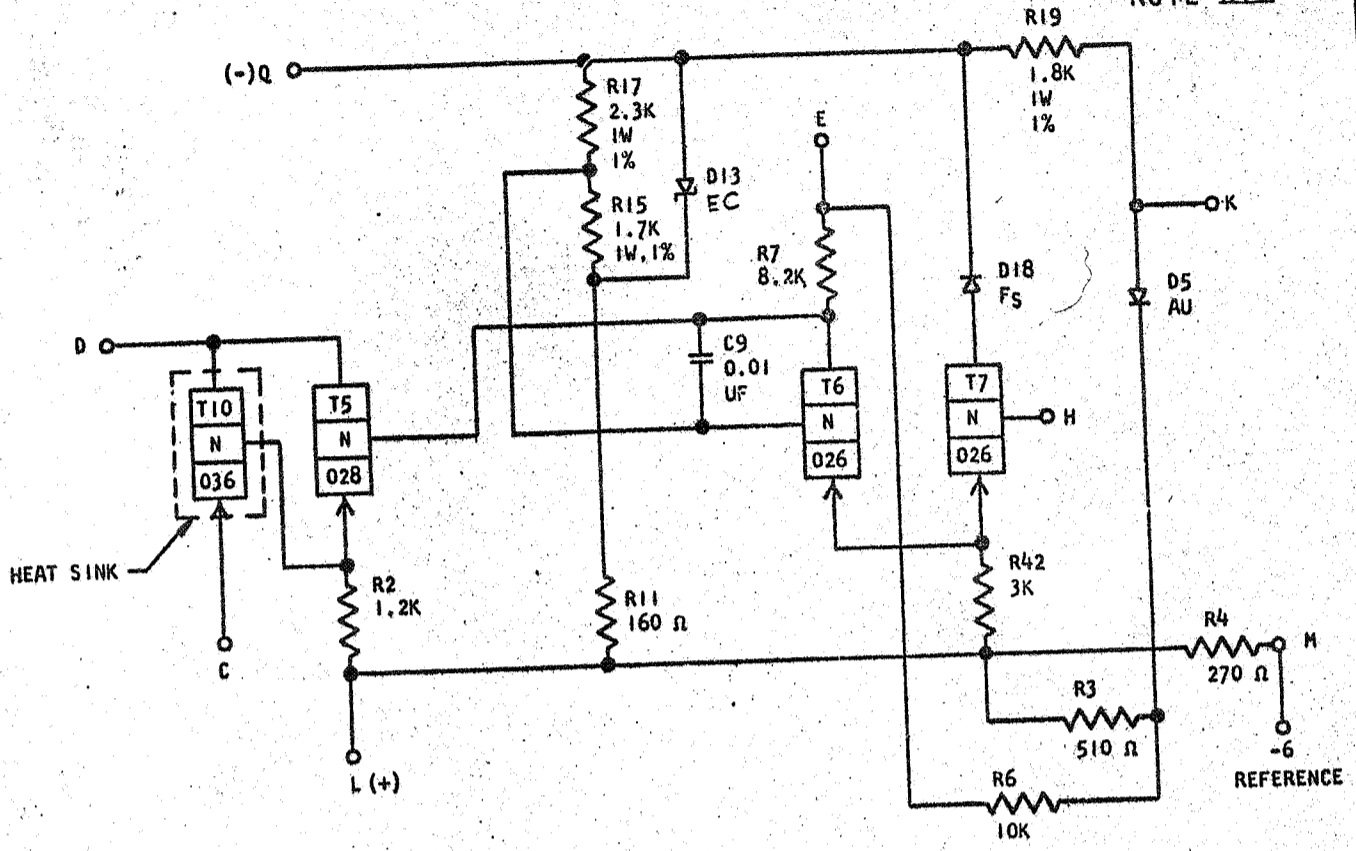
COMPONENT SIDE

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR-	6-8-61	111822	NOTE XIV				88-2159
REFERENCE TO -6 VOLTS							370613
DIAG JPM 4-21-61 SCALE NONE							
CHICA CWS 4-25-61 DRAW VE 5-15-61							
APPROV CHC 6-2-61 CHECK JMR 6-18-61							

370613
STANDARDS CODE
2-7045
YGM -

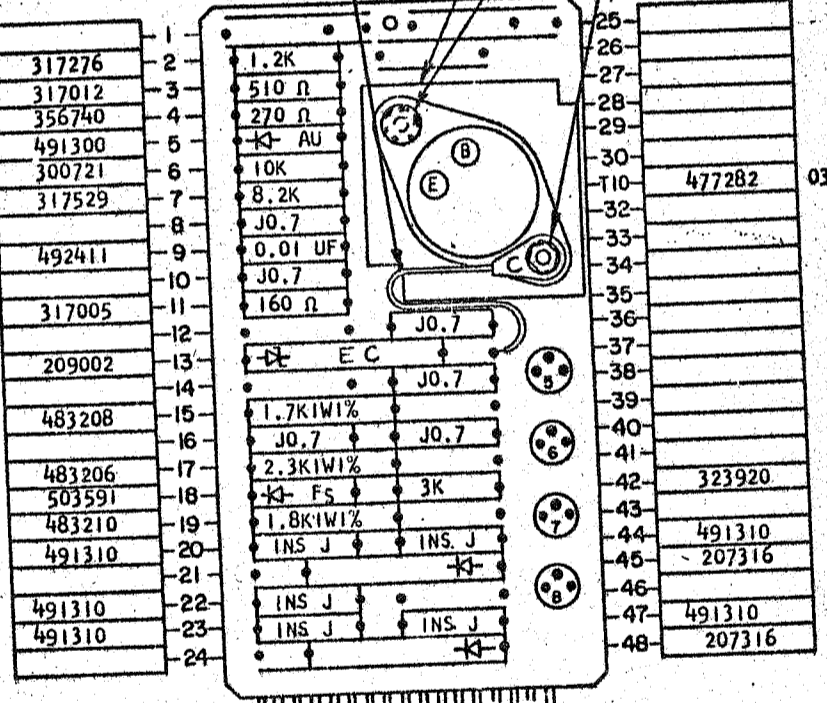
REFERENCE TO -6 VOLTS
MOUNT CARD ON ONE INCH CENTERS - NOTE XVI

370613
RESTRICTED
NOTE XIV



- 483129 SPACER
- 483138 SCREW
- 62031(2) LOCKWASHER
- NOTE XIX
- 8446(2) WASHER
- 483128 SCREW
- 38051(2) NUT
- 62031 LOCKWASHER
- NOTES XVII, XVIII

- NOTES
- X CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 892613
 - XI ASSEMBLE TO ENGINEERING SPECIFICATION 895396 AND 891999
 - XII ALL RESISTORS ARE 1/2 WATT AND $\pm 5\%$ UNLESS OTHERWISE NOTED
 - XIII "J" IN BLOCK DENOTES BARE WIRE JUMPER 491296 UNLESS OTHERWISE NOTED
 - * XIV TECHNICAL LABORATORY EVALUATION INCOMPLETE. ADDITIONAL USAGE TO BE AVOIDED. THIS PART IS SUBJECT TO WITHDRAWAL.
 - XV DO NOT CRIMP TRANSISTOR LEADS. MAXIMUM HEIGHT THAT COMPONENTS MAY PROJECT ABOVE SURFACE OF THE CARD WILL BE .610
 - XVII CASE IS ELECTRICALLY CONNECTED TO COLLECTOR. CONNECTION COMPLETED THROUGH JUMPER
 - XVIII WASHER 8446 TO BE PLACED BETWEEN HEAT SINK AND CARD SURFACE.
 - XIX PLACE ONE LOCKWASHER 62031 ON EACH SIDE OF NUT



B

CIRCUIT AND PACKAGING STANDARD		HOLE PATTERN		APPROVAL		DATE		CHANGE NO.		APPROVAL		DEVELOPMENT NO.	
		493457		JH Tokas		1/24/62		D113950		NOTE XIV		88-2159	
INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	370613			
NAME CARD ASM TSTR -				6-8-61	111822	NOTE XIV	6-21-62	D113950	NOTE XIV				
REFERENCE TO -6 VOLTS				12-1-61	112448	NOTE XIV	8-30-62	113136	NOTE XIV				
DESIGN	EDF	12-20-61	MODEL SMS	12-26-61	112448A	NOTE XIV							
DETAIL	JH	12-29-61	SCALE NONE	2-6-62	113685	NOTE XIV							
CHECK	EDF	1-4-62	DRAW VE	1-9-62									
APPRO	GWS	2-5-62	CHECK DVS	1-10-62	3-28-62	113967	NOTE XIV						

82-3987-2 6-22-61

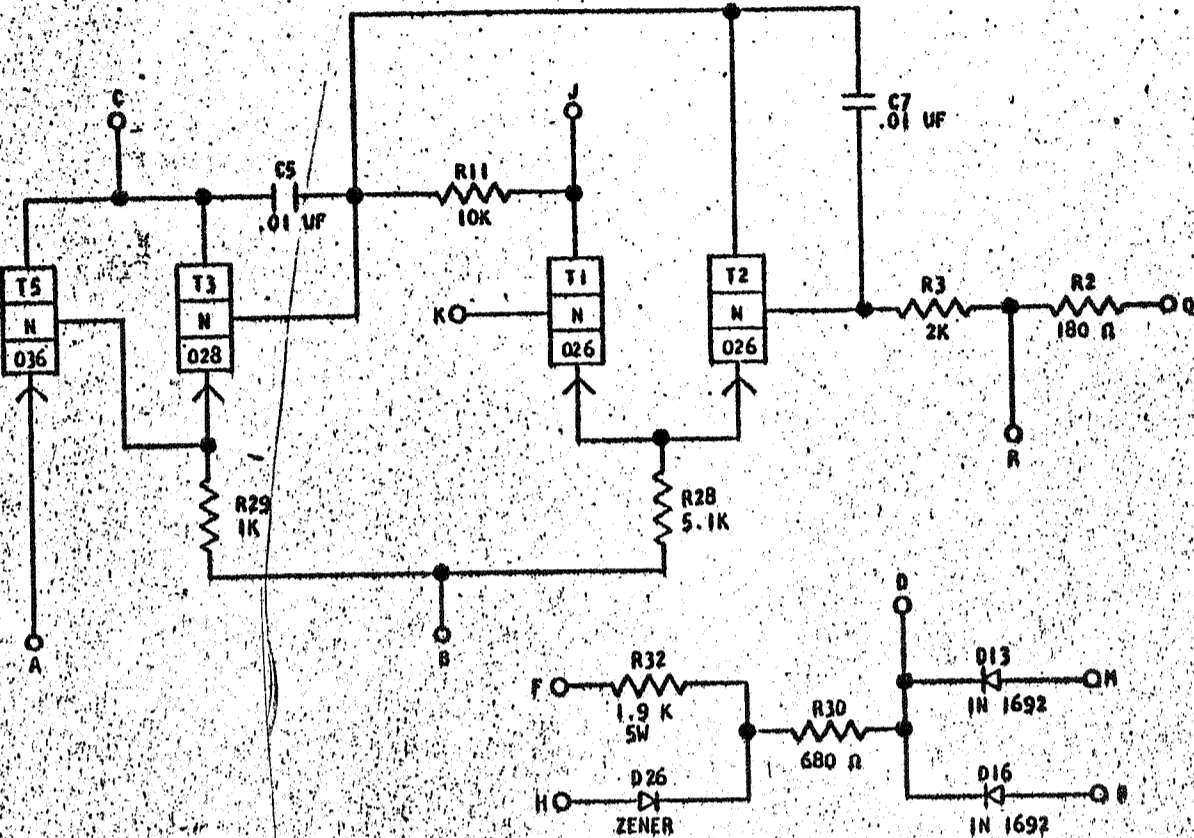
370616

3 VOLT MARGINAL CHECK DIFF AMP
MOUNT CARD ON ONE INCH CENTERS - NOTE XVIII

RESTRICTED NOTE XIV

370616

STANDARDS
CODE
2-7045

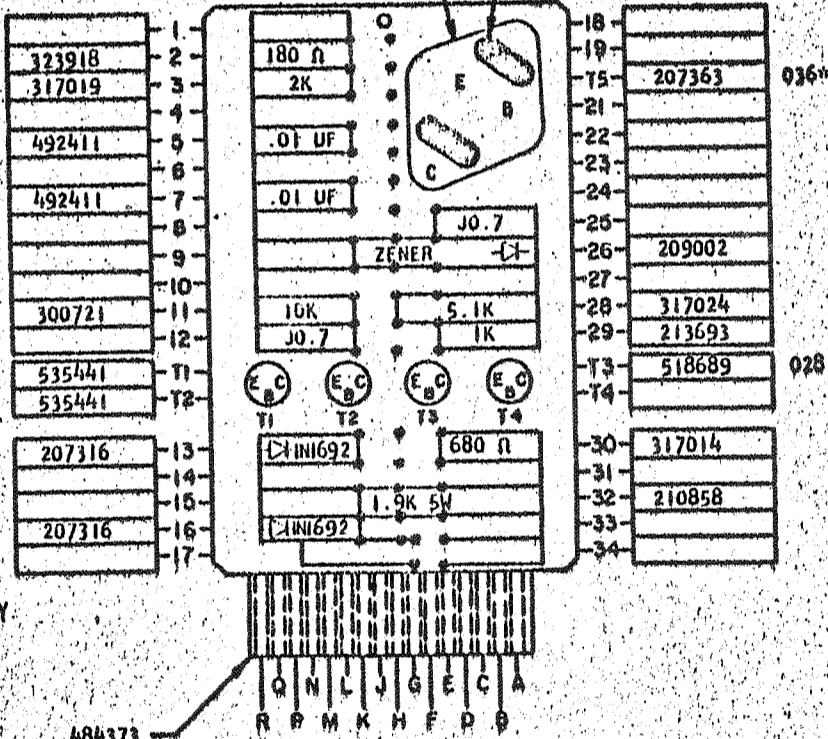


483044 TSTR 5PCR
NOTES XIV, XV, XVI

100601 EPOXY
NOTE XVII
2 AREAS

NOTES

- X CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION
- XI ASSEMBLE TO ENGINEERING SPECIFICATION 896396 AND 891899
- XII ALL RESISTORS ARE 1/2 WATT AND ±5% UNLESS OTHERWISE NOTED
- XIII "J" IN BLOCK DENOTES BARE WIRE JUMPER, 491296
- XIV TECHNICAL LABORATORY EVALUATION INCOMPLETE. ADDITIONAL USAGE TO BE AVOIDED. THIS PART SUBJECT TO WITHDRAWAL.
- XV DO NOT CRIMP TSTR LEADS. HAND SOLDER TSTR TO BOARD AFTER CLEANING. MOUNT TSTR .015 MIN TO .020 MAX ABOVE SURFACE OF CARD. USE SPACER 483044 (3) ON TSTR 207363. PUT TWO BEADS OF 100601 EPOXY ACROSS THE BOTTOM OF 036 TSTR 207363 AND BAKE AT 125 ± 5°F FOR 20 MINUTES MIN.
- XVI CUT INSULATING TAPE PART NO. 483029 TO A DIA OF .750 ± .010 AND APPLY TO TOP OF TSTR 207363.
- XVII EPOXY AREAS TO BE 3/16 TO 1/4 INCH WIDE BY APPROX .030 HEIGHT BEFORE MOUNTING
- XVIII MAX HEIGHT THAT COMPONENTS MAY PROJECT ABOVE SURFACE OF CARD WILL BE .405



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE

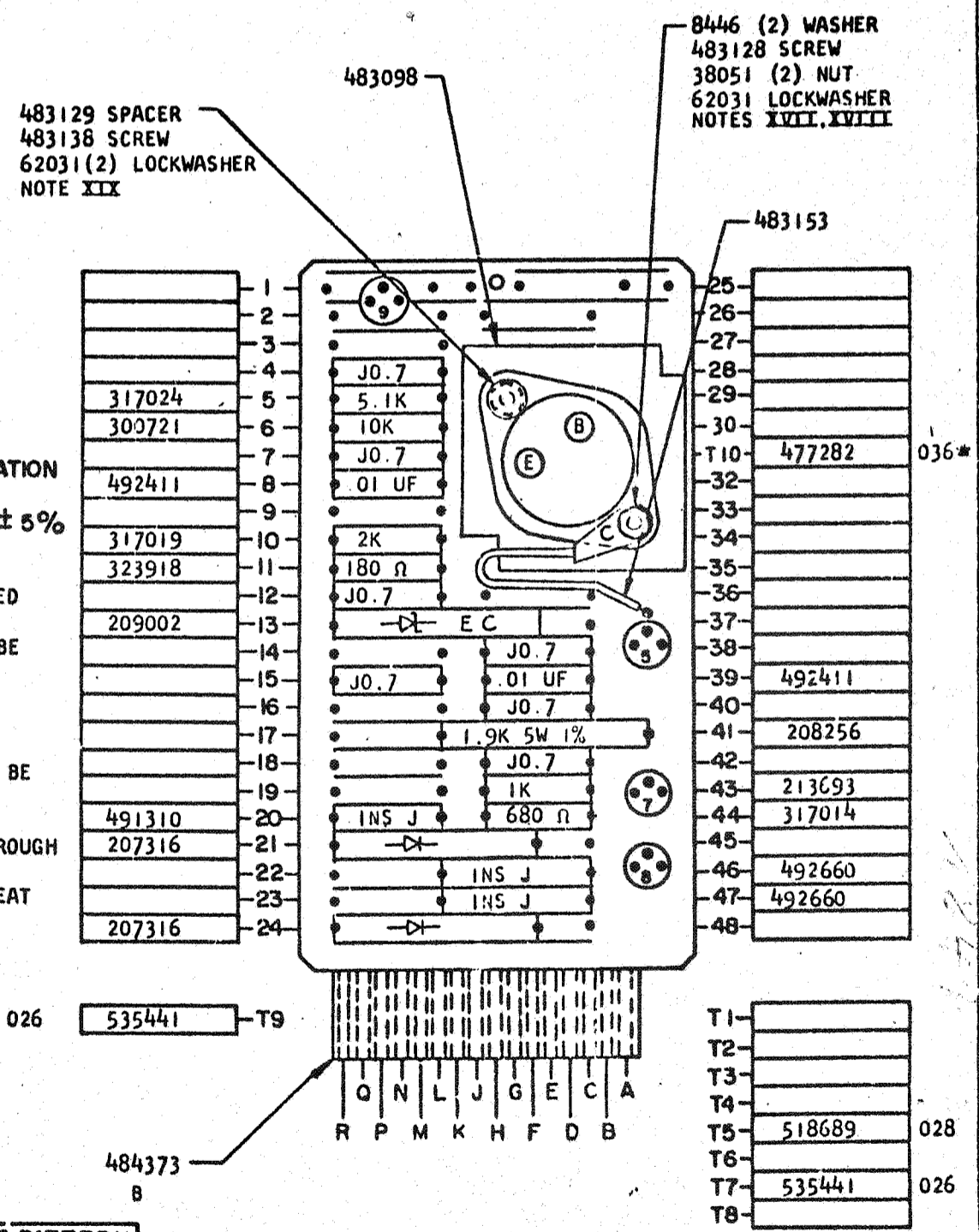
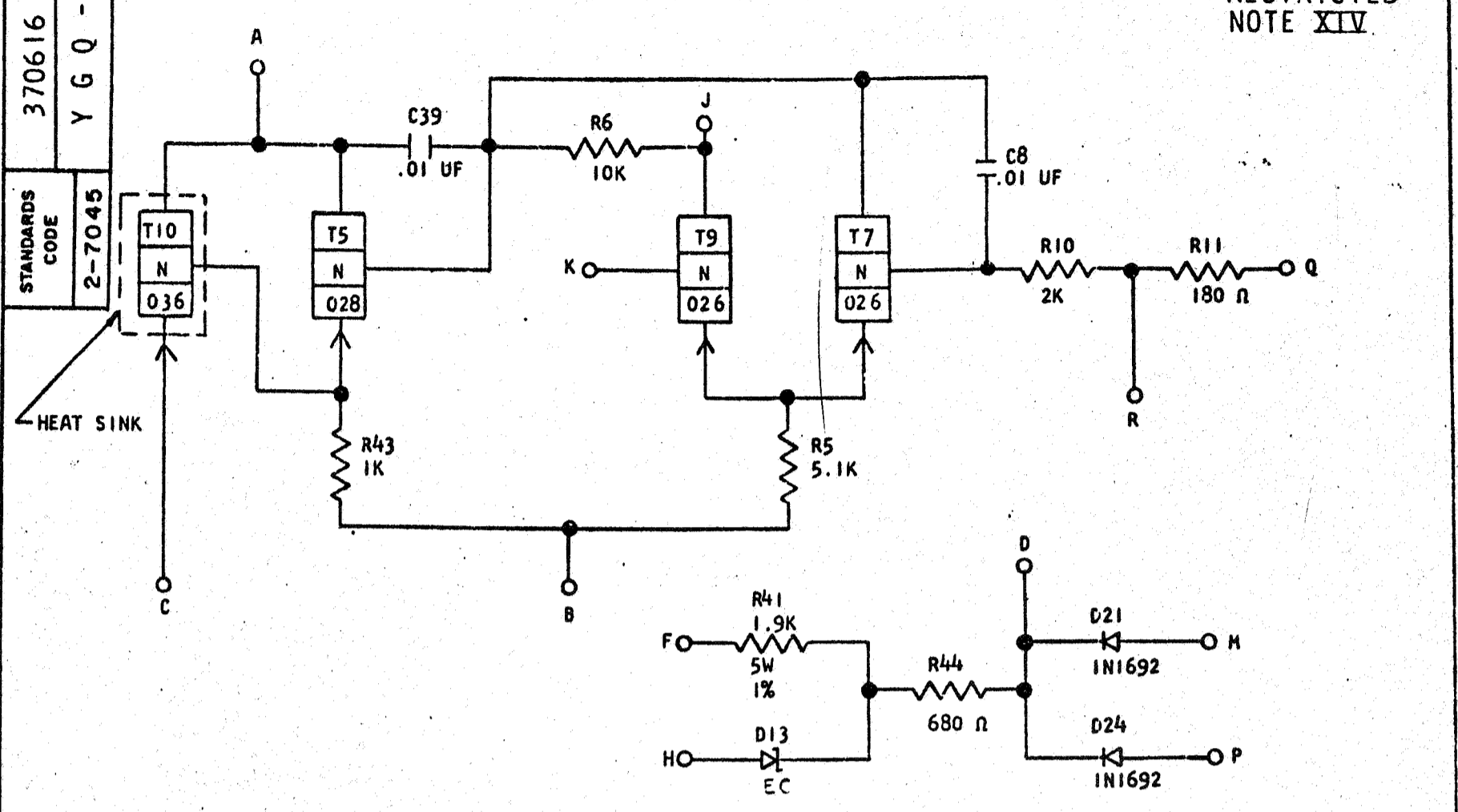
INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD ASM TSTR-3 VOLT	6-8-61	111822	NOTE XIV				88-2165
MARGINAL CHECK DIFF AMP								
DESIGN	TYPE SMS PERSUP							
DETAIL	RFS 5-11-61	SCALE NONE						
CHECK	PLP 6-1-61	DRAW MDE 5-22-61						
APPROV	HS 6-7-61	CHECK MVI 5-24-61						

370616

3 VOLT MARGINAL CHECK DIFF AMP
MOUNT CARD ON ONE-INCH CENTERS - NOTE XVI

370616

RESTRICTED
NOTE XIV



- NOTES
- X CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 892616
 - XI ASSEMBLE TO ENGINEERING SPECIFICATION 895396 AND 891999
 - XII ALL RESISTORS ARE 1/2 WATT AND $\pm 5\%$ UNLESS OTHERWISE NOTED
 - XIII "J" IN BLOCK DENOTES BARE WIRE JUMPER 491296 UNLESS OTHERWISE NOTED
 - * XIV TECHNICAL LABORATORY EVALUATION INCOMPLETE. ADDITIONAL USAGE TO BE AVOIDED. THIS PART SUBJECT TO WITHDRAWAL.
 - XV DO NOT CRIMP TRANSISTOR LEADS.
 - XVI MAXIMUM HEIGHT THAT COMPONENTS MAY PROJECT ABOVE SURFACE OF CARD WILL BE .610.
 - XVII CASE IS ELECTRICALLY CONNECTED TO COLLECTOR, CONNECTION COMPLETED THROUGH JUMPER.
 - XVIII WASHER 8446 TO BE PLACED BETWEEN HEAT SINK AND CARD SURFACE
 - XIX PLACE ONE LOCKWASHER 62031 ON EACH SIDE OF NUT

CIRCUIT AND PACKAGING STANDARD		HOLE PATTERN		COMONENT SIDE			
APPROVAL	DATE	493457					
J H Tokos	1/24/62						
INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR - 3 VOLT MARGINAL CHECK DIFF AMPLIFIER	6-8-61	111822	NOTE XIV				88-2165
DESIGN EDF 12-20-61 MODEL SMS	12-1-61	112448	NOTE XIV				
DETAIL JH 12-29-61 SCALE NONE	12-26-61	112448 A	NOTE XIV				
CHECK EDF 1-4-62 DRAW MDE 1-8-62	2-6-62	113685	NOTE XIV				
APPRO GWS 2-5-62 CHECK MDE 1-9-62	3-28-62	113967	NOTE XIV				

82-3987-2 6-22-61

370616

370825

Y J G

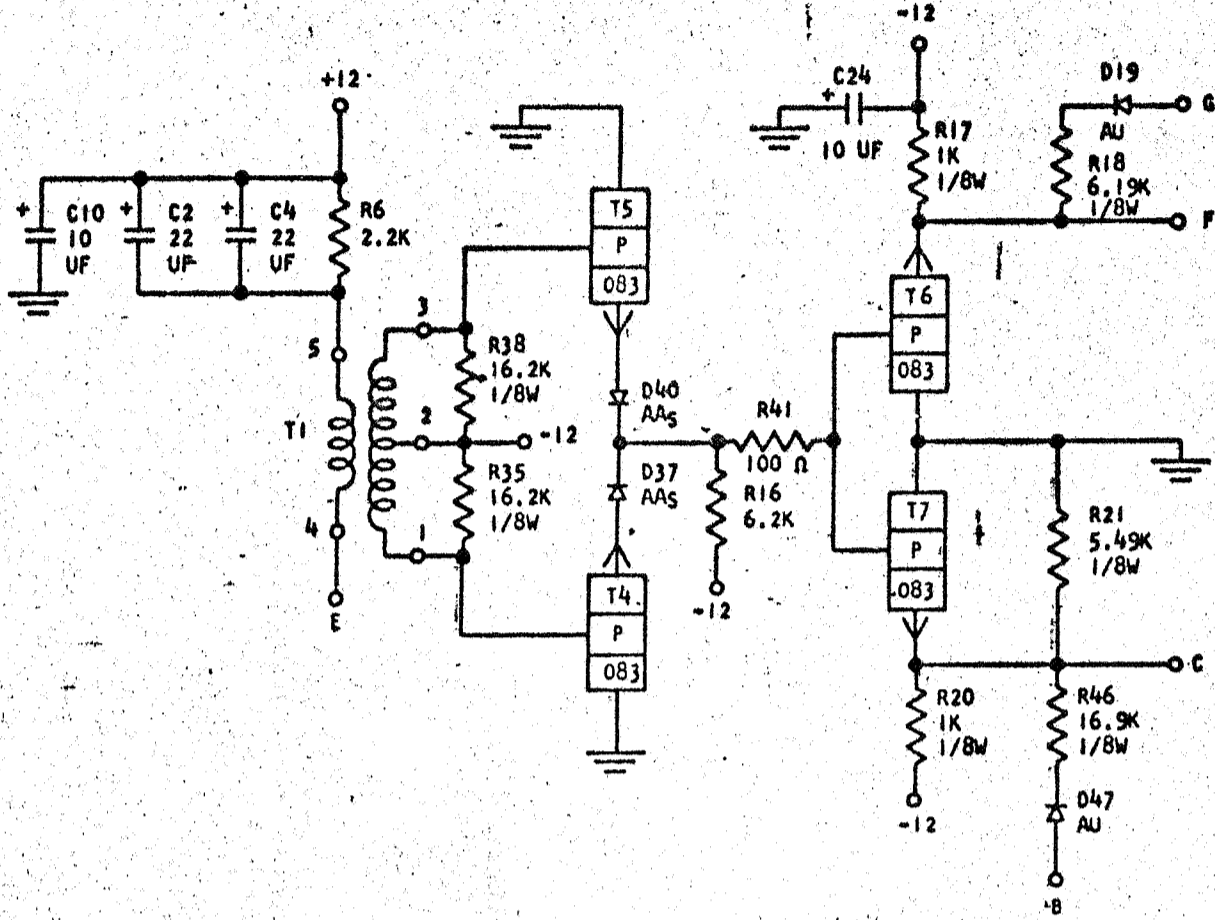
STANDARDS CODE

2-7045

SENSE AMPLIFIER-RECTIFIER AND CLIPPER #2

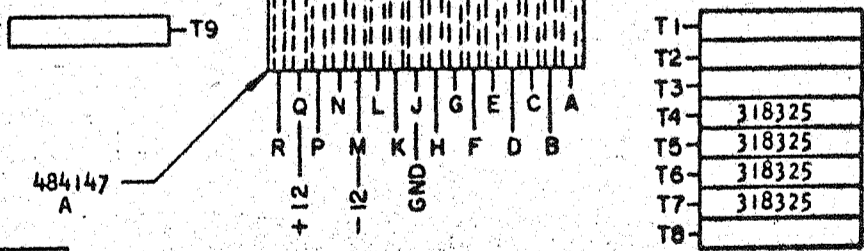
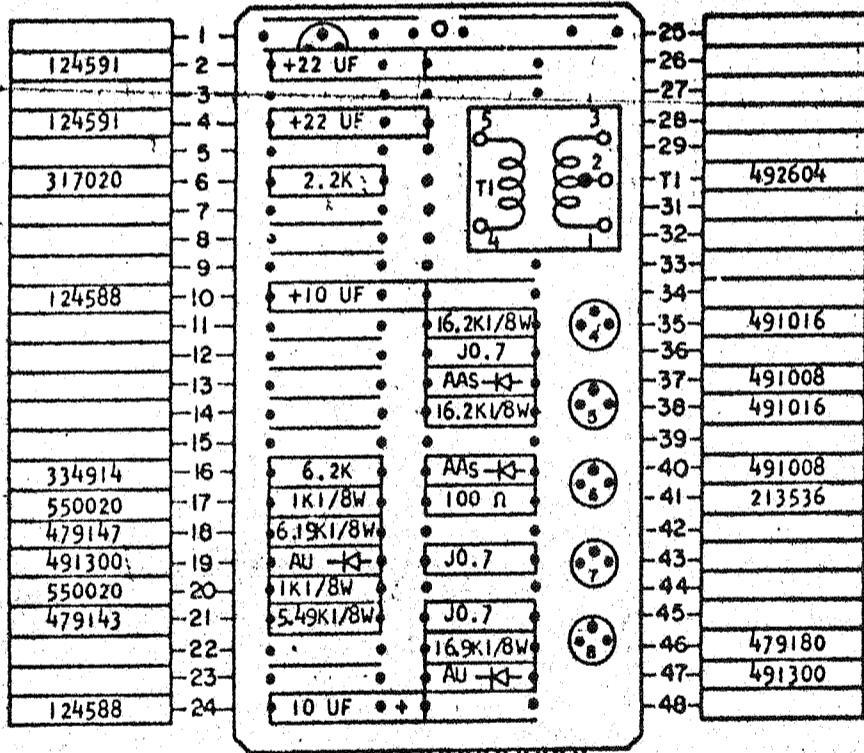
MOUNT CARD ON ONE AND ONE HALF INCH CENTERS NOTE XIV

370825



NOTES

- X CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 892825
- XI ASSEMBLE TO ENGINEERING SPECIFICATION 895396 AND 891999
- XII ALL RESISTORS ARE 1/2 WATT AND ± 5% UNLESS OTHERWISE NOTED (AS NOTE XIV)
- XIII "J" IN BLOCK DENOTES BARE WIRE JUMPER 491296
- XIV MAXIMUM HEIGHT COMPONENT MAY PROJECT ABOVE THE SURFACE OF THE CARD WILL BE .870
- XV ALL 1/8 WATT RESISTORS ARE ± 1%



B

CIRCUIT AND PACKAGING STANDARD		HOLE PATTERN		APPROVAL		DATE		DEVELOPMENT NO.	
		493457		KMT		9-29-61		370825	
INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	2547-1723	
NAME CARD ASM TSTR - SENSE		10-18-61	112750	JWB					
AMPLIFIER-RECTIFIER AND CLIPPER #2		4-18-62	113921	LHR					
DESIGN	RMB 9-27-61	MODEL	SMS 1401						
DETAIL	RMB 9-27-61	SCALE	NONE						
CHECK	GRD 9-28-61	DRAW	VE 10-12-61						
APPRO	WJR 9-28-61	CHECK	10-12-61						

82-3987-2 6-22-61

370825

ALLOY - FIELD REPLACEMENT, AM CARD

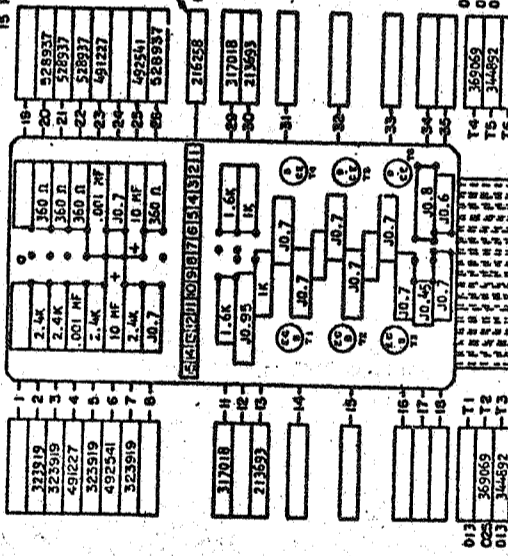
CAP CONFIGURATION

Table with 17 columns labeled 1-17 and rows of O's and X's indicating capacitor configuration for various circuit types.

Table with columns: CIRCUIT NAME, CAP CODE, ASM NO, TEST SPEC

CIRCUIT NAME	CAP CODE	ASM NO	TEST SPEC
ONE WAY H BLOCKS ALL LOADS	ZZ	371200	891200
ONE WAY H BLOCKS IN B LOADS	ZY	371201	891201
ONE WAY H BLOCKS OUT B LOADS	ZX	371202	891202
ONE WAY H BLOCKS NO LOADS	YY	371203	891203
H TRANSMISSION LINE DRIVER	WX	371208	891208

Table listing capacitor values and part numbers for different circuit blocks.

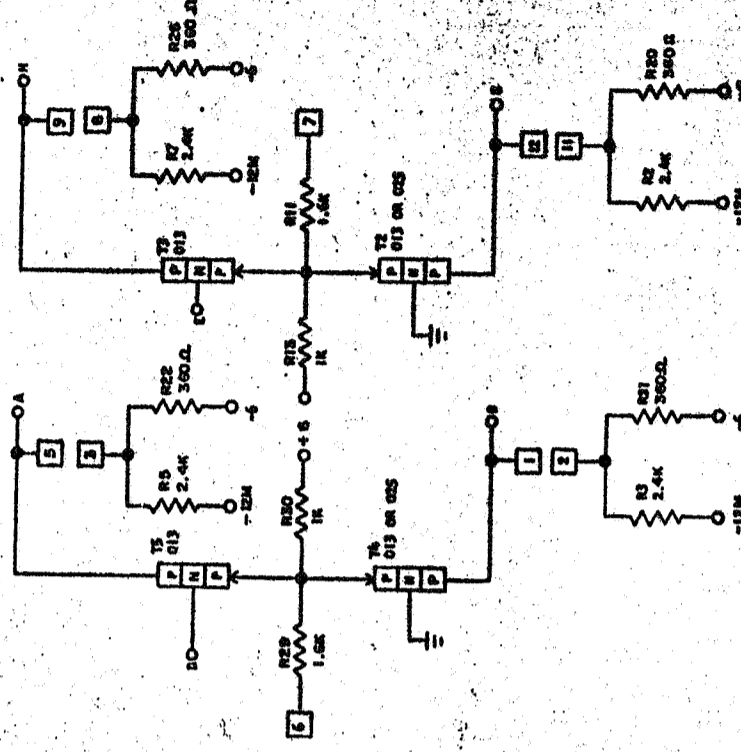


NOTES:
I CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATIONS 891200 AND 891208
II ASSEMBLE TO ENGINEERING SPECIFICATION 8-5305 AND 891999
III ALL RESISTORS ARE 1/2 WATT AND ±5% UNLESS OTHERWISE NOTED
IV IN BLOCK DEMOTES BARE WIRE JUMPER, REFERENCE 216259 MALE CONTACT STRIP TO BE USED AS REQUIRED TO PROGRAM DESIRED CAP CODE
V

370904

APPROVAL	DATE
KMT	5-12-60

370904
DISCONTINUED
STANDARD CODE 2-7045
CARD CODE AH**



INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME (CARD ASM TSTR) ALLET	7-17-60	10098	1WB	11-15-60	110511	1WB	2547-1109
FIELD DEVELOPMENT (AM CARD)							
DESIGN (15-8117) (S1MS)							
SERIALIZED (15-8117) (S1MS)							
CHECKED (15-8117) (S1MS)							
APPROVED (15-8117) (S1MS)							

370975

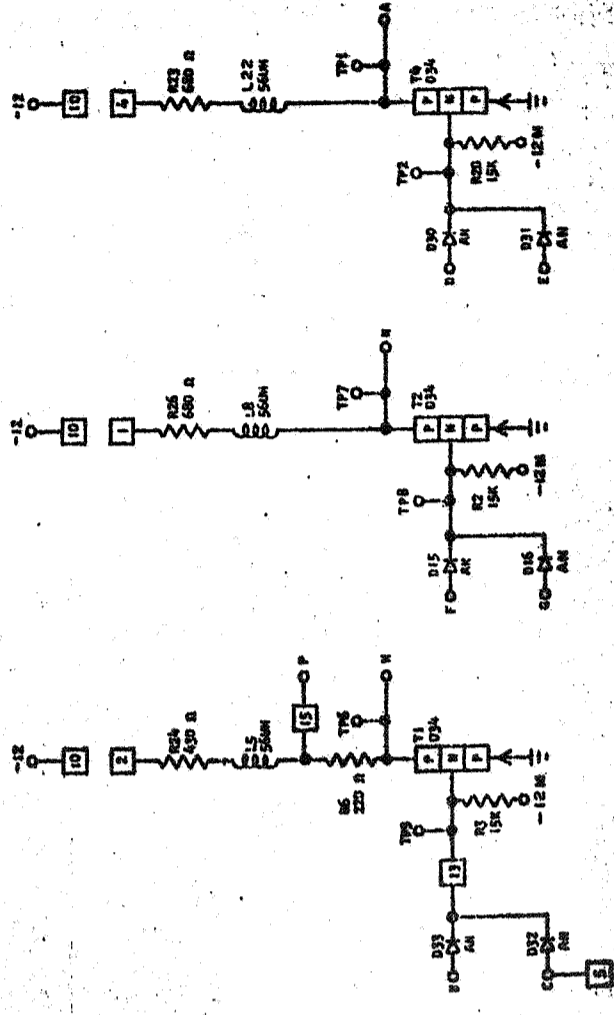
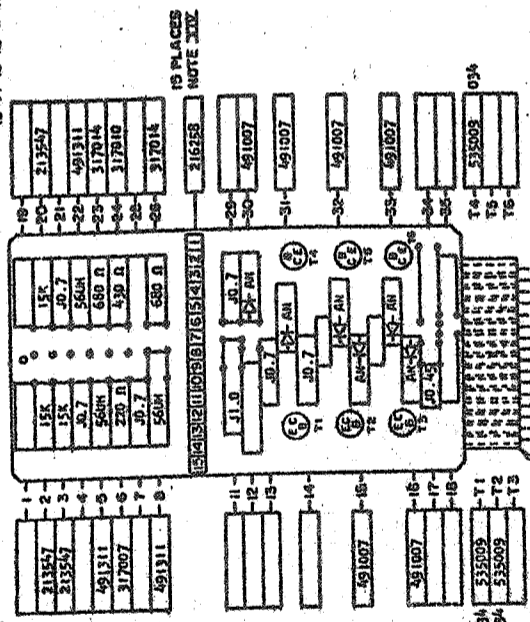
CTDL TWO WAY AND PNP
FIELD REPLACEMENT

DISCONTINUED

370975

CAP CONFIGURATION

CIRCUIT NAME	SP	ASAM NO	TEST
CTDL 2 WAY AND PNP	1W	37121	991071
CTDL 2 WAY AND PNP-TWO LOADS	1W	37121	991071
CTDL 3 WAY AND PNP-ONE LOAD	1V	37122	991071
CTDL 3 WAY AND PNP-TWO LOADS	1V	37123	991071
CTDL 3 WAY AND PNP-THREE LOADS	1V	37124	991071
CTDL 3 WAY AND PNP-FOUR LOADS	1V	37125	991071
CTDL 3 WAY AND PNP-FIVE LOADS	1V	37126	991071
CTDL 3 WAY AND PNP-SIX LOADS	1V	37127	991071
CTDL 3 WAY AND PNP-SEVEN LOADS	1V	37128	991071
CTDL 3 WAY AND PNP-EIGHT LOADS	1V	37129	991071
CTDL 3 WAY AND PNP-NINE LOADS	1V	37130	991071
CTDL 3 WAY AND PNP-TEN LOADS	1V	37131	991071
CTDL 3 WAY AND PNP-ELEVEN LOADS	1V	37132	991071
CTDL 3 WAY AND PNP-TWELVE LOADS	1V	37133	991071
CTDL 3 WAY AND PNP-THIRTEEN LOADS	1V	37134	991071
CTDL 3 WAY AND PNP-FOURTEEN LOADS	1V	37135	991071
CTDL 3 WAY AND PNP-FIFTEEN LOADS	1V	37136	991071
CTDL 3 WAY AND PNP-SIXTEEN LOADS	1V	37137	991071
CTDL 3 WAY AND PNP-SEVENTEEN LOADS	1V	37138	991071
CTDL 3 WAY AND PNP-EIGHTEEN LOADS	1V	37139	991071
CTDL 3 WAY AND PNP-NINETEEN LOADS	1V	37140	991071
CTDL 3 WAY AND PNP-TWENTY LOADS	1V	37141	991071
CTDL 3 WAY AND PNP-TWENTY-ONE LOADS	1V	37142	991071
CTDL 3 WAY AND PNP-TWENTY-TWO LOADS	1V	37143	991071
CTDL 3 WAY AND PNP-TWENTY-THREE LOADS	1V	37144	991071
CTDL 3 WAY AND PNP-TWENTY-FOUR LOADS	1V	37145	991071
CTDL 3 WAY AND PNP-TWENTY-FIVE LOADS	1V	37146	991071
CTDL 3 WAY AND PNP-TWENTY-SIX LOADS	1V	37147	991071
CTDL 3 WAY AND PNP-TWENTY-SEVEN LOADS	1V	37148	991071
CTDL 3 WAY AND PNP-TWENTY-EIGHT LOADS	1V	37149	991071
CTDL 3 WAY AND PNP-TWENTY-NINE LOADS	1V	37150	991071
CTDL 3 WAY AND PNP-THIRTY LOADS	1V	37151	991071



NOTES
 I CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 691071
 II ASSEMBLY TO ENGINEERING SPECIFICATION 691071
 III ALL RESISTORS ARE 1/2 WATT AND ±5% UNLESS OTHERWISE NOTED
 IV 500R BLOCK DENOTES BARE WIRE JUMPER
 V REFERENCE-216259 MALE CONTACT STRIP TO BE USED AS REQUIRED TO PROGRAM DESIRED CAP CODE

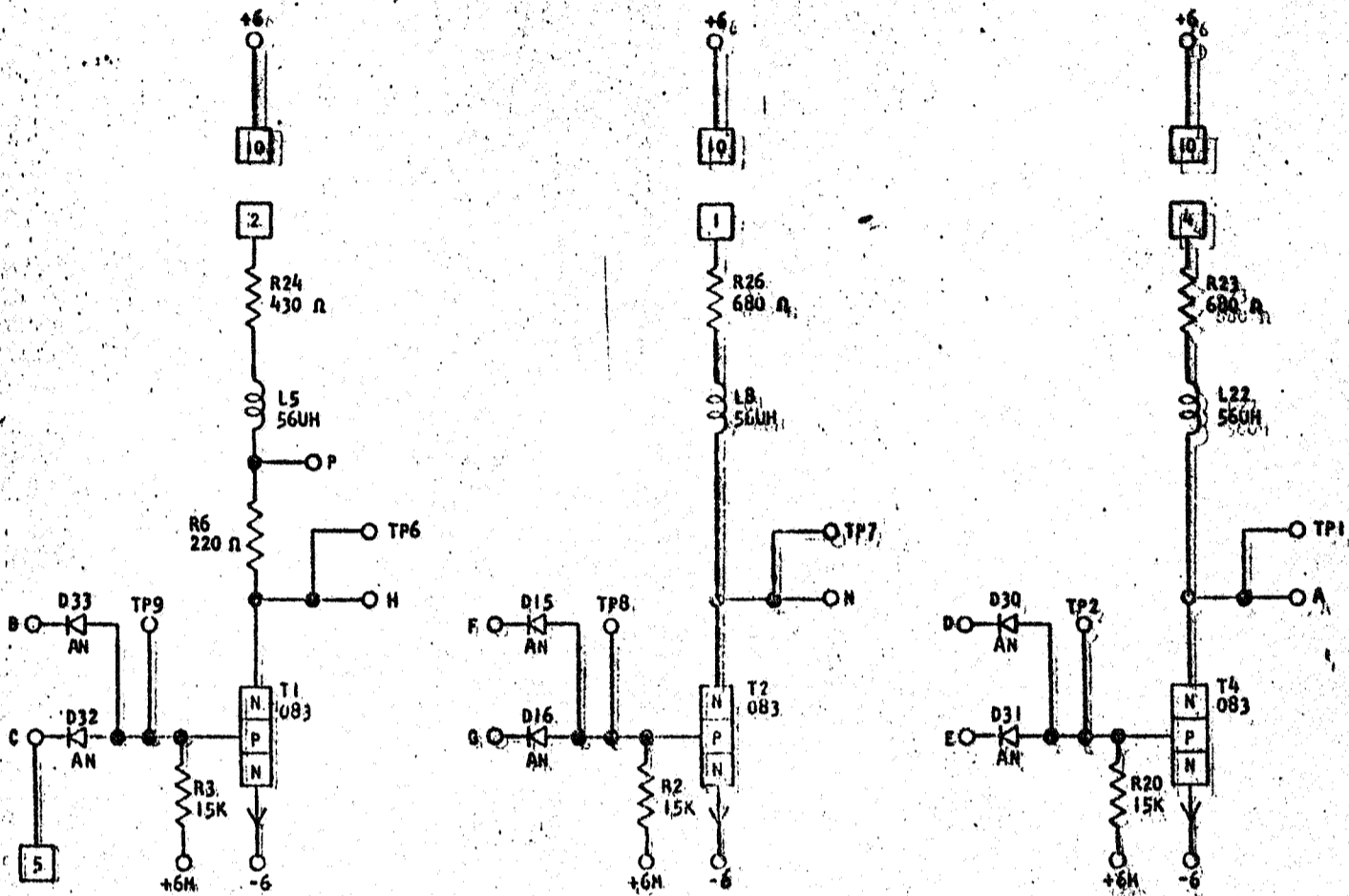
DATE	REVISION
7-2-60	1

INTERNATIONAL NUMBER	ISSUE	DATE	CHANGE NO	APPROVAL	FACT	CHANGE NO	APPROVAL	REPLACEMENT NO.
MANUFACTURE ASM TBR-CTDL	1	11-4-60	105842	1WB				X0868
MANUFACTURE TWO WAY AND PNP	1	11-4-60	109300	1WB				
DETAIL	1	12-1-60	110617	1WB				
DETAIL	1	12-1-60	110617	1WB				
DETAIL	1	12-1-60	110617	1WB				
DETAIL	1	12-1-60	110617	1WB				

CEDDL TWO WAY AND NPN
FIELD REPLACEMENT

CARD CODE	STANDARD CODE	370976
CH **	2-7045	

DISCONTINUED



SHEET 4 OF 23. E.C. 109642

SECTION 108 B

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR-CTDL	8-4-60	109642	JWB				X0667
TWO WAY AND NPN							
DESIGN							
DETAIL							
CHECK	78J	8-1-60	DRW	HUE	7-7-60		
APPROV	BES	8-1-60	CHECK	JWB	7-13-60		

370976

370976

370978
 CLASS CODE CK 2-7043

DISCONTINUED

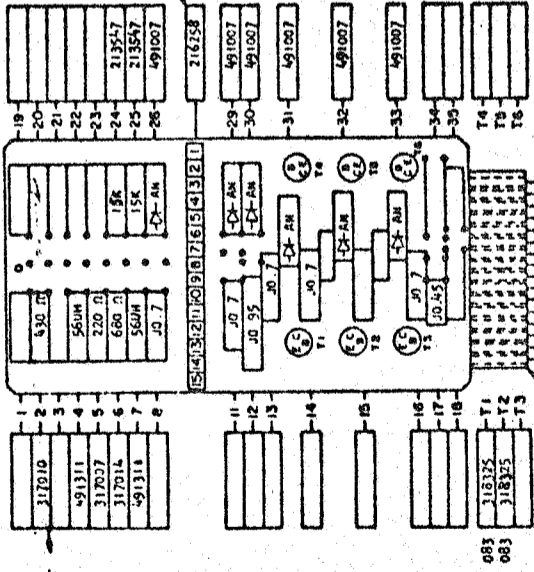
CTDL 3 WAY AND MPN FIELD REPLACEMENT

CAP CONFIGURATION

891071

CIRCUIT NAME	ASSEMBLY NO.	TEST SPEC.
CTDL 3 WAY AND MPN EXTENDED INPUT	371072	891072
CTDL 3 WAY AND MPN	371256	891071
CTDL 3 WAY AND MPN-1 LOAD	371259	891071
CTDL 3 WAY AND MPN-NO LOAD	371270	891071

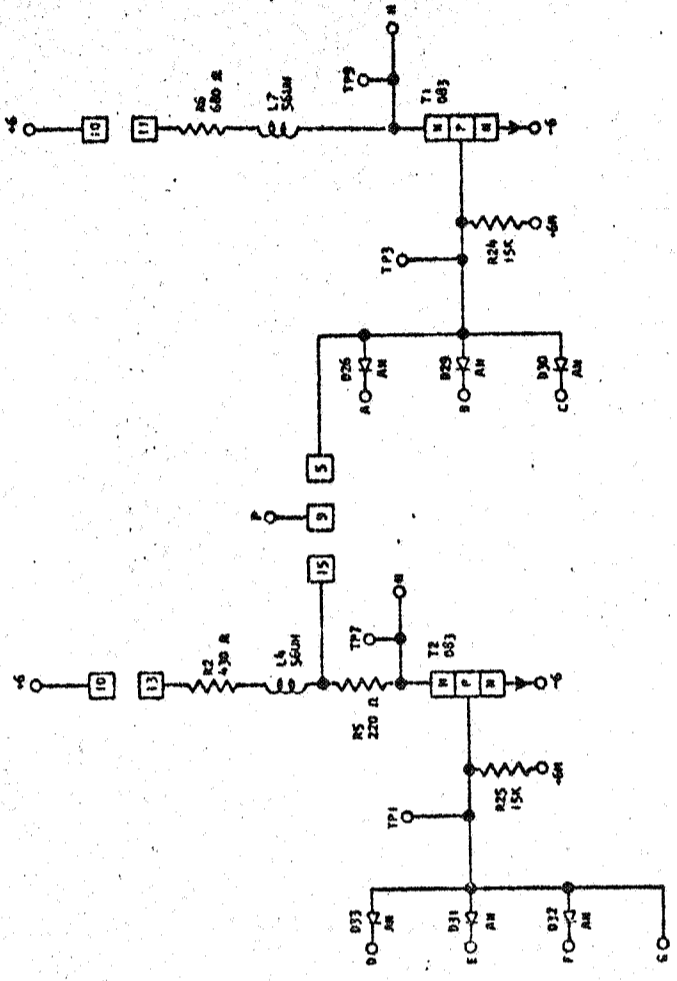
5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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15 PLACES

NOTES:
 I CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 891071
 II ASSEMBLY TO ENGINEERING SPECIFICATION 891071
 III ALL RESISTORS ARE 1/2 WATT AND ±5%
 IV UNLESS OTHERWISE NOTED
 V 'J' IN BLOCK DESIGNATES BARE WIRE JUMPER.
 VI REFERENCE - 216259 MALE CONTACT STRIP TO BE USED AS REQUIRED TO PROGRAM DESIRED CAP CODE

528997
 REVISIONS
 DATE 17-6-60



370978	DEVELOPMENT NO.	X0662
DATE	APPROVAL	
CHARGE NO.		
INTERNATIONAL BUSINESS MACHINES FORM		
DATE	APPROVAL	
9-30-60	110190	
3-30-60	110190	
11-23-60	110190	
11-23-60	110190	

370979

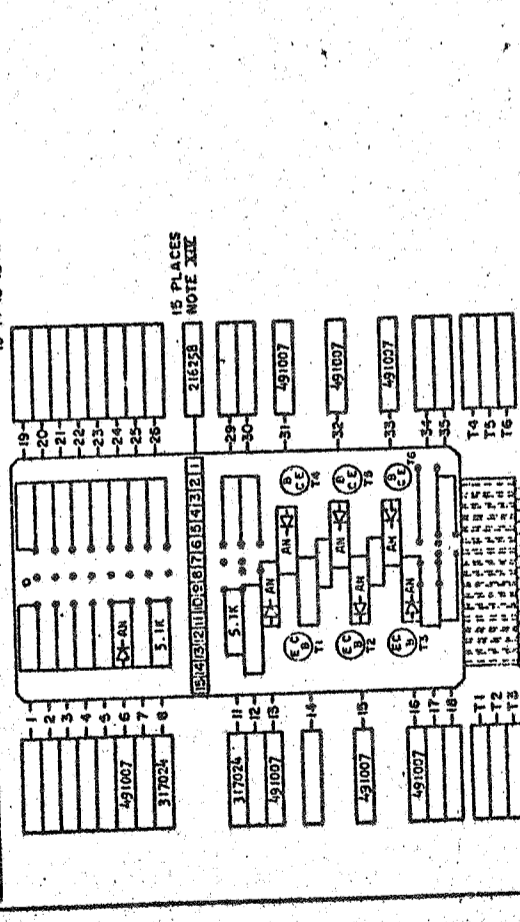
CARD TOOK	370979
STANDARD CODE	2-7048

DISCONTINUED

CTDL EXTENDER CARD
FIELD REPLACEMENT

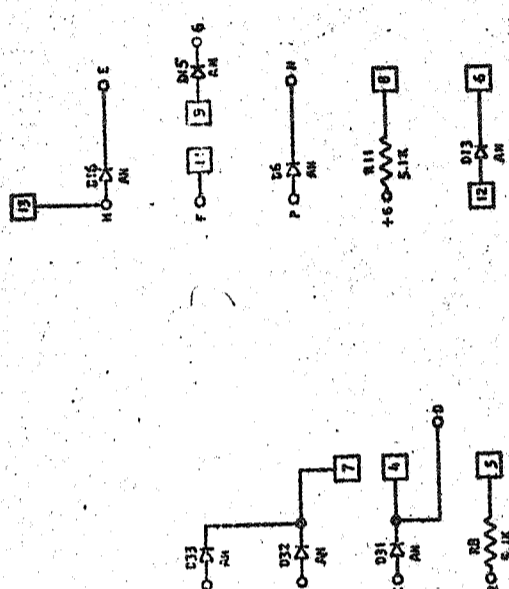
CAP CONFIGURATION

CIRCUIT NAME	CAP SW	ASM NO	TEST SPEC	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CTDL - P OR EXTENDED CARD	VS	371071																
CTDL - N CS EXTENDED CARD	VS	371074																
CTDL EXTENDED CARD	VA	371075																
CTDL EXTENDED CARD	VQ	371559	891071															



NOTES
 I CIRCUIT NOT CONFORM TO ENGINEERING SPECIFICATION 891071
 II ASSEMBLY TO BE USED FOR TESTING PURPOSES ONLY
 III RESISTORS ARE 1/2 WATT AND ±5%
 IV UNLESS OTHERWISE NOTED
 V REFERENCE - 26255 HALE CONTACT STRIP TO BE USED AS REQUIRED TO PROGRAM DESIRED CAP CODE

370979	
APPROVAL	DATE
H. B. H. H.	7-6-60



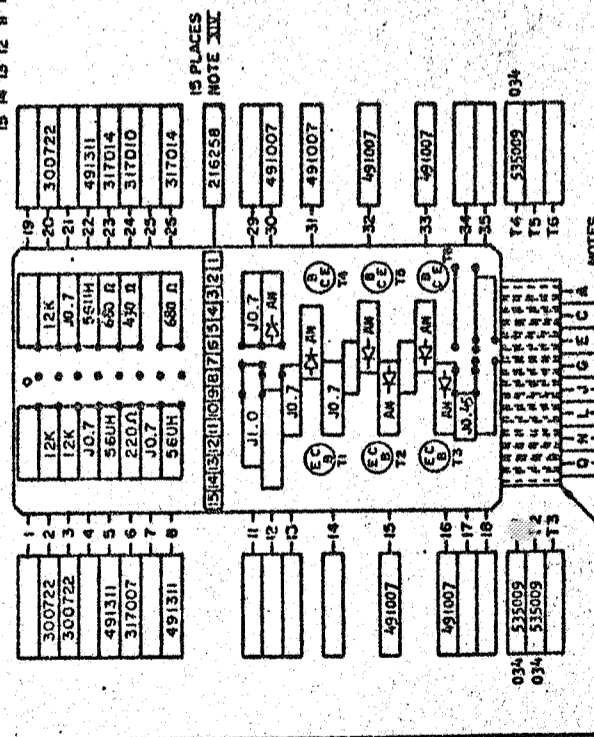
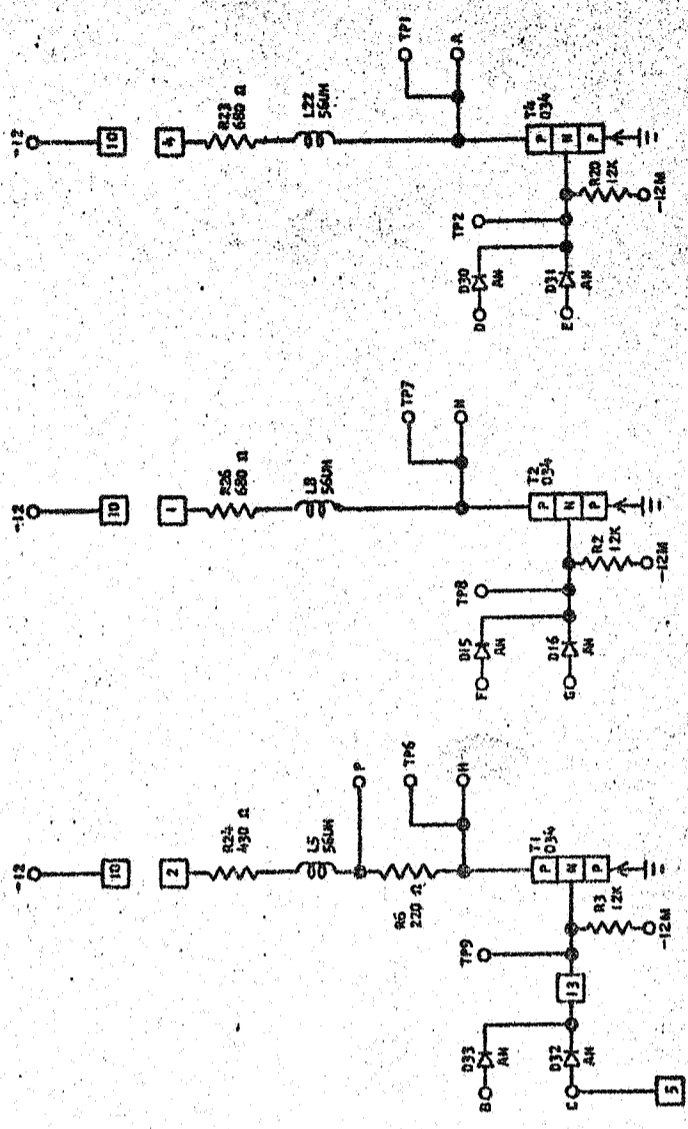
INTERNATIONAL SURVEY MACHINE CODE	DATE	APPROVAL	DEVELOPMENT NO.
370979	9-4-60		X0661
REVISION	DATE	APPROVAL	
1	9-4-60	IWB	
2	11-11-60	IWB	
3	12-1-60	IWB	
4	2-15-61	DUNOTE	

370983
 STAGING CODE
 CARD CODE JG ee 2-70-65

CTDL HIGH SPEED 2 WAY AND PNP
 FIELD REPLACEMENT

CAP CONFIGURATION

CIRCUIT NAME	CAP CODE	ASH NO	TEST SPEC	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CTDL 2 WAY AND PNP-ALL LOADS	WV	37150	891576	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CTDL 2 WAY AND PNP-2 LOADS	VW	37151	891576	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CTDL 2 WAY AND PNP-1 LOAD	VV	37152	891576	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CTDL 2 WAY AND PNP-3D LOAD	-	37153	891576	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



NOTES
 I CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 891576
 II ASSEMBLE TO ENGINEERING SPECIFICATION 892396 AND 891999
 III ALL RESISTORS ARE 1/2 WATT AND ±5% UNLESS OTHERWISE NOTED
 IV IN BLOCK DEMOTES BARE WIRE JUMPER, 491299
 V REFERENCE - 216259 MALE CONTACT STRIP TO BE USED AS REQUIRED TO PROGRAM DESIRED CAP CODE

370983

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASMA ISTR - CTDL HIG	8-4-60	1056A2	0729	X0664
SPEED 2 WAY BRG PNP	9-27-60	DH0084	1WB	
DETAIL	12-1-60	H0517	1WB	
SCALE	2-20-61	DI0291	1WB	
TYPE				
DRG				
DATE				
BY				
CHK				

370983

APPROVAL

DATE 7-6-60

492299

370982

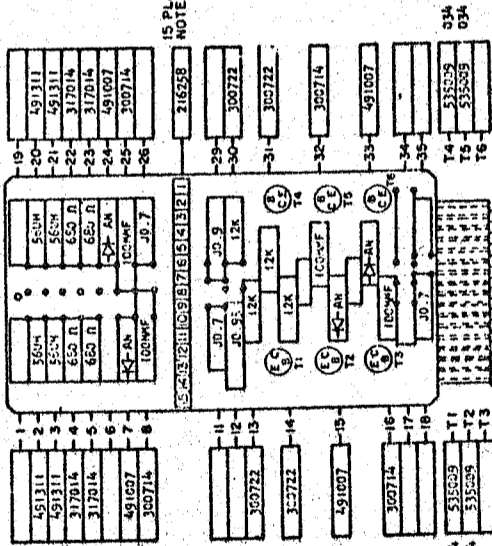
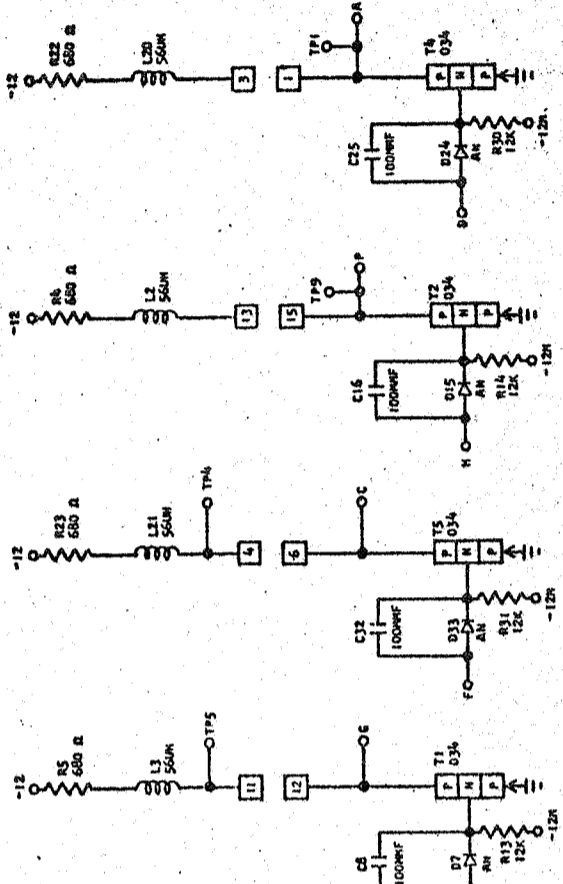
370982
 STANDARD CODE
 CARD CODE JF ** 2-70-83

CTDL HIGH SPEED ONE WAY PNP
 FIELD REPLACEMENT

CAP CONFIGURATION

CIRCUIT NAME	CAP ASN NO		CAP CONFIGURATION														
	VP	VR	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CTDL HIGH SPEED 1 WAY PNP-ALL LOADS	371576	891576	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CTDL HIGH SPEED 1 WAY PNP-TWO LOADS	371577	891576	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CTDL HIGH SPEED 1 WAY PNP-ONE LOAD	371578	891576	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CTDL HIGH SPEED 1 WAY PNP-NO LOAD	371579	891576	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DISCONTINUED



NOTES:
 I. CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 891576
 II. RESISTOR TOLERANCE IS 5% UNLESS OTHERWISE NOTED
 III. ALL RESISTORS ARE 1/2 WATT AND 25%
 IV. UNLESS OTHERWISE NOTED
 V. IN BLACK DEVICES BASE WIRE JUMPER.
 VI. REFERENCE-28286 MALE CONTACT STRIP TO BE USED AS REQUIRED TO PROGRAM DESIRED CAP CODE

370982

INTERNAL BUSINESS NUMBER	DATE	CHANGE NO	REVISION	APPROVAL	DATE	CHANGE NO	REVISION	APPROVAL	DATE
370982	7-1-60	1	1						

370982

DATE	REVISION	APPROVAL	DATE
7-1-60	1		

370984

CARE CODE
JH
STANDARDS CODE
2-7045

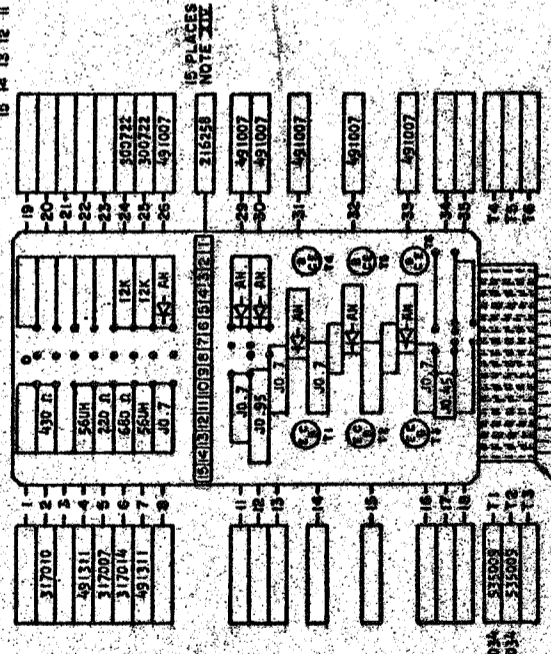
DISCONTINUED

CTDL HIGH SPEED 3 WAY AND PNP
FIELD REPLACEMENT

CAP CONFIGURATION

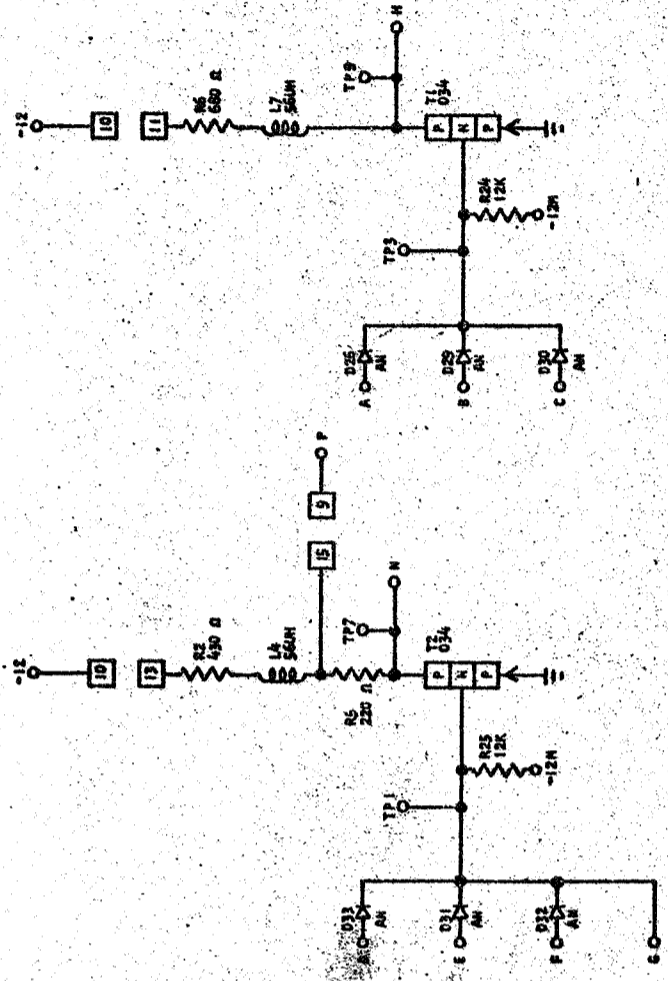
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CTDL 3 WAY AND PNP-ALL LOADS															
CTDL 3 WAY AND PNP-I LOAD															
CTDL 3 WAY AND PNP-NO LOAD															

CIRCUIT NAME	CAP. CODE	ASIM NO.	TEST
CTDL 3 WAY AND PNP-ALL LOADS	UV	37158A	BB1576
CTDL 3 WAY AND PNP-I LOAD	VU	37158B	BB1576
CTDL 3 WAY AND PNP-NO LOAD	-	37158C	BB1576



NOTES:
 I CREDIT MUST CONFORM TO ENGINEERING SPECIFICATION 291576
 II ASSEMBLE TO ENGINEERING SPECIFICATION
 III RESISTORS PER 1/2 WATT AND ±5%
 IV UNLESS OTHERWISE NOTED
 V IN BLOCK DENOTES BARE WIRE JUMPER,
 4P/296
 VI REFERENCE-216259 MALE CONTACT STRIP TO
 BE USED AS REQUIRED TO PROGRAM DESIRED
 CAP CODE

APPROVAL: *[Signature]* DATE: 7-6-63



INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
INTEGRATED ASIM TESTER - CTDL	8-4-60	10962	<i>[Signature]</i>				
HIGH SPEED 3 WAY AND PNP	9-27-60	DH0084	IWB				X0659
TESTER							
INSTALL	12-1-60	110517	IWB				
REPAIR							
SPECIAL INSTRUCTIONS							

370984

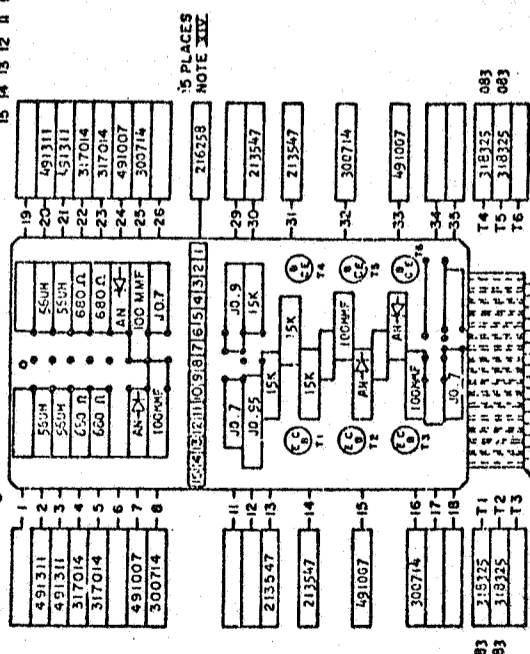
370985
 STANDARD CODE
 CARD CODE JJ **
 2-7045

CTDL HIGH SPEED ONE WAY NPN
 FIELD REPLACEMENT

CAP CONFIGURATION

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CTDL HIGH SPEED 1 WAY NPN-ALL LOADS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CTDL HIGH SPEED 1 WAY NPN-2 LOADS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CTDL HIGH SPEED 1 WAY NPN-ONE LOAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CTDL HIGH SPEED 1 WAY NPN-NO LOAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CIRCUIT NAME	CAP CODE	ASM NO.	TEST SPEC
CTDL HIGH SPEED 1 WAY NPN-ALL LOADS	VP	371587	891576
CTDL HIGH SPEED 1 WAY NPN-2 LOADS	YN	371588	891576
CTDL HIGH SPEED 1 WAY NPN-ONE LOAD	VA	371589	891576
CTDL HIGH SPEED 1 WAY NPN-NO LOAD	-	371590	891576



NOTES
 I CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 891576
 II ASSEMBLE TO ENGINEERING SPECIFICATION
 III ALL RESISTORS ARE 1/2 WATT AND 5%
 IV OTHERS ARE TO BE SPECIFIED
 V IN BLOCK LETTERS
 VI 491007 IS A 100µF CAPACITOR
 VII REFERENCE - 218249 MALE CONTACT STRIP TO BE USED AS REQUIRED TO PROGRAM DESIRED CAP CODE

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME: CARD ASM TEST - CTDL	8-24-68	05562					370985
DESIGN: HIGH SPEED 1 WAY NPN	9-24-68	1010084	IWB				X0663
REVISED: A	12-11-68	110517	IWB				
DATE: 8-24-68							

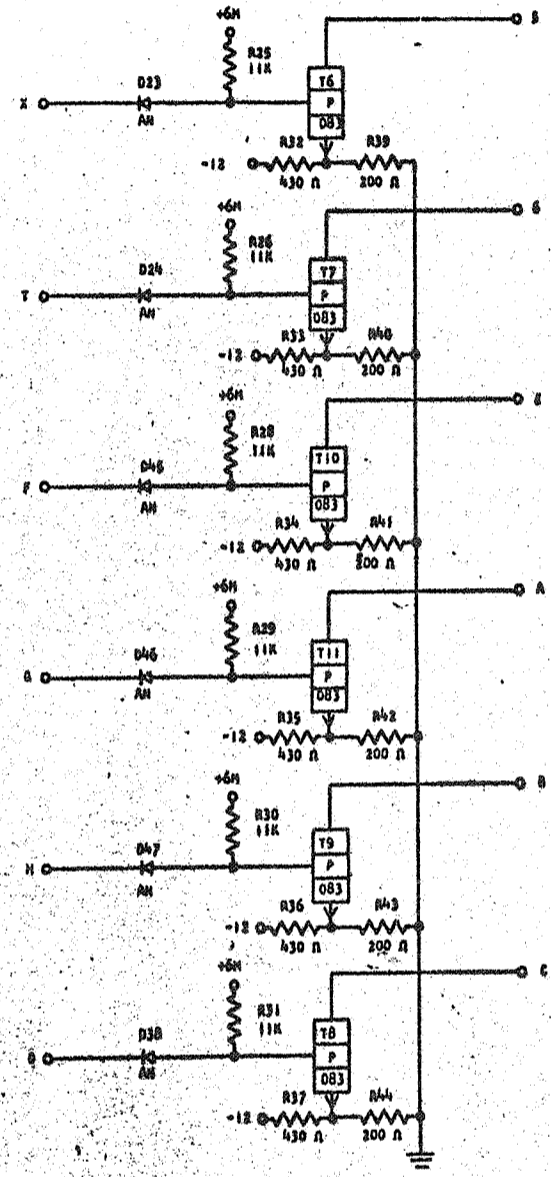
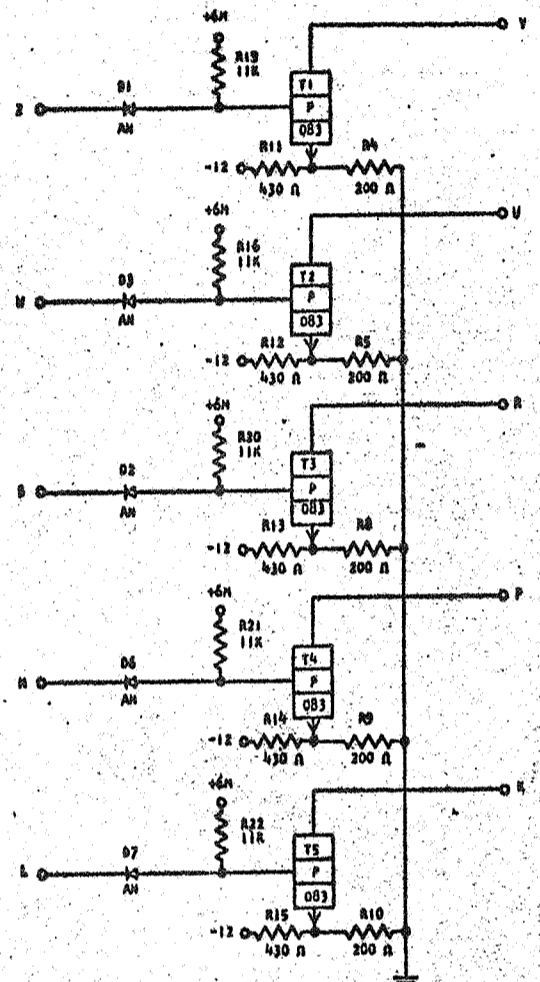
492503
 DPD CIRCUIT & PACKAGES STANDARD
 APPROVAL: *H. B. White*
 DATE: 2-6-60

37335

STANDARD
CODE
2-7045

CARD CODE
37335
D J F -

SHEET 1 OF 2



VOLTAGE PIN
+6V J, I, S AND V
-12 L
+6H P

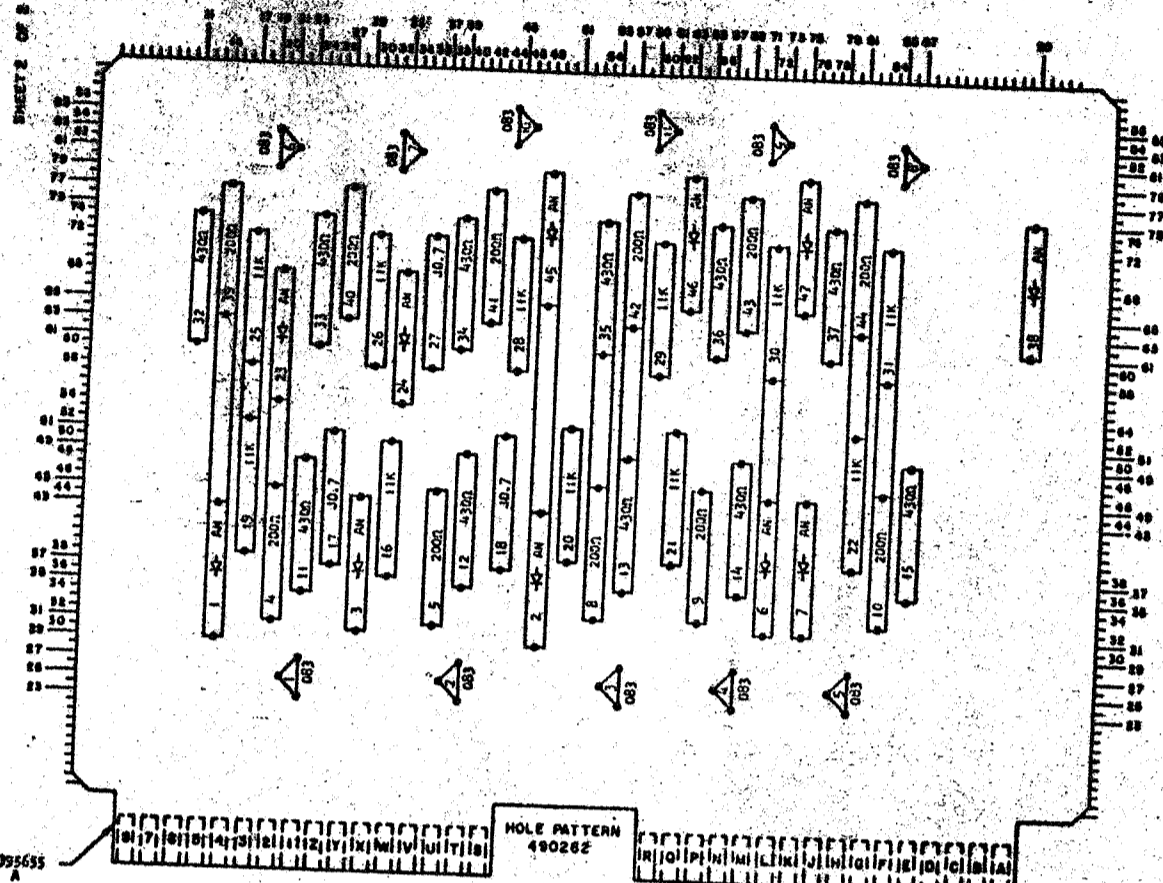
CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE

INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHARGE NO.	APPROVAL	DATE	CHARGE NO.	APPROVAL	DEVELOPMENT NO.
NAME TWIN CARD ASH - LINE DRIVERS		7-11-62	143645	NDL				X1242
DESIGN	VE	8-15-62						
CHECK	VE	8-15-62						
APPROV	VE	8-15-62						

37335

373335
3-7048

373335
D J F -



PART NO.	VALUE	QTY.
317006	2000	11
317010	4300	11
317027	11K	11
491007	AN	11
318325	083	11

POSITION	VALUE	LOWER HOLE	UPPER HOLE
1	AN	1429	1443
2	AN	4829	4843
3	AN	2930	2944
4	2000	2031	2045
5	2000	3731	3745
6	AN	7231	7245
7	AN	7631	7645
8	2000	5432	5446
9	2000	6532	6546
10	2000	8432	8446
11	4300	2334	2348
12	4300	4035	4049
13	4300	5735	5749
14	4300	6435	6449
15	4300	8735	8749
16	11K	1336	1350
17	JO.7	2637	2651
18	JO.7	4437	4451
19	11K	1738	1752
20	11K	5138	5152
21	11K	6238	6252
22	11K	8138	8152
23	AN	4054	2068
24	AN	3354	3368
25	11K	1758	1772
26	11K	3058	3072
27	JO.7	3658	3672
28	11K	4558	4572
29	11K	6058	6072
30	11K	7258	7272
31	11K	8458	8472
32	4300	1160	1174
33	4300	2460	2474
34	4300	3960	3974
35	4300	5460	5474
36	4300	6660	6674
37	4300	7860	7874
38	AN	9961	9975
39	2000	1463	1477
40	2000	3263	3277
41	2000	4263	4277
42	2000	5763	5777
43	2000	6963	6977
44	2000	8163	8177
45	AN	4865	4879
46	AN	6365	6379
47	AN	7565	7579

POSITION	TYPE	E	B	C
1	083	2327	2125	2329
2	083	4027	3825	4029
3	083	5727	5525	5729
4	083	6927	6725	6929
5	083	8127	7925	8129
6	083	1979	2181	1983
7	083	3279	3481	3283
8	083	4579	4781	4583
9	083	7181	7383	7185
10	083	8481	8683	8485
11	083	9982	6184	9986

NOTES
 I CIRCUIT MUST CONFORM TO ENGINEERING SPECIFICATION 003150
 II ASSEMBLE TO ENGINEERING SPECIFICATION 003001
 III "A" IN BLOCK DENOTES SPARE WIRE JUMPER 491296
 XXX ALL RESISTORS ARE 1/2 WATT AND ±5% UNLESS OTHERWISE NOTED

CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
NAF	8-6-62

INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHARGE NO.	APPROVAL	DATE	CHARGE NO.	APPROVAL	DEVELOPMENT NO.
TYPE 4 LINE DRIVERS		7-27-62	113615	MDL				
DESIGN	MODEL SWS 14-01	12-20-62	0124728	MDL				X 1242
DETAIL VE	8-20-62 SCALE NONE							
CHECK VE	8-30-62 DRAW VE	8-20-62						
APPRO	SWS	8-20-62						

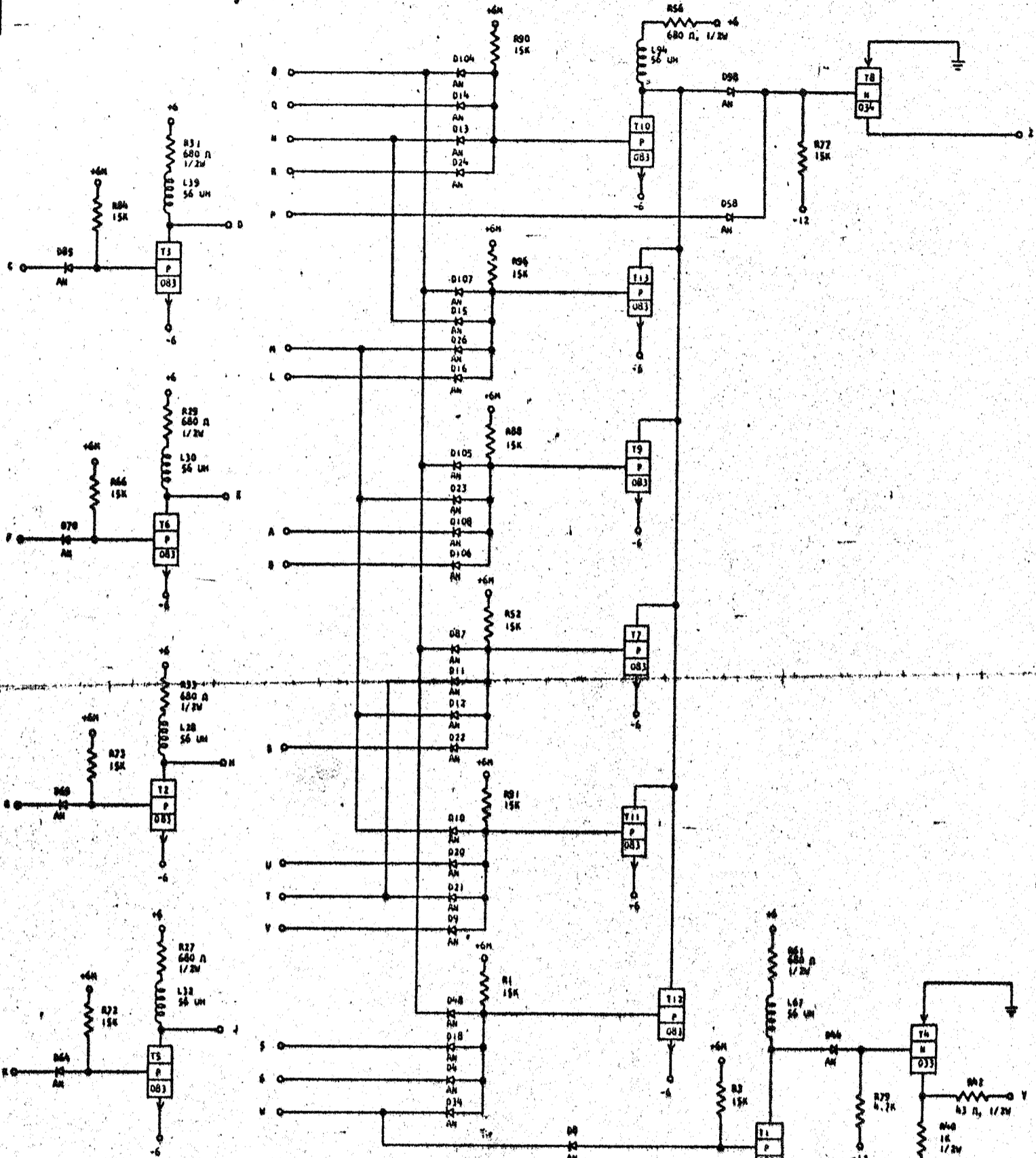
373335

373336

STANDARD CODE
E-7045

CARD CODE
D J D - 373336

SHEET 1 OF 2



VOLTAGE PIN

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2 2 2 2

3 3 3 3

4 4 4 4

5 5 5 5

6 6 6 6

7 7 7 7

8 8 8 8

9 9 9 9

0 0 0 0

CIRCUIT AND PACKAGING STANDARD

APPROVAL DATE

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME: TWIN CARD ASM - FILE				4-21-62	113615	MDL				X1325
PROGRAM SKIP				12-10-62	D114720	MDL				
DESIGN	VE	8-15-62	SLAL	SPS	1501					373336
DRAWN	VE	8-15-62	SLAL	HOME						
CHECKED	VE	8-15-62	SLAL	VE	18-16-62					
APPROVED										

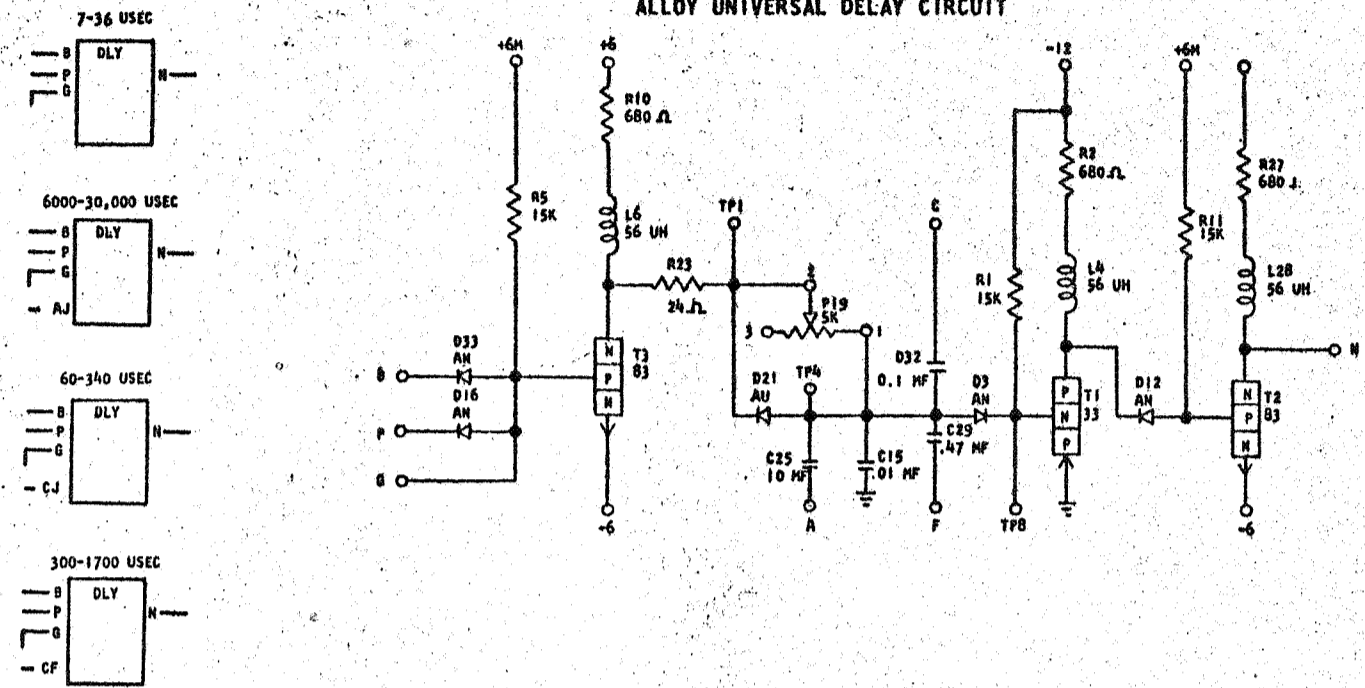
373336/1

729800
STANDARDS CODE

CARD CODE 729800
A A F -

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371884

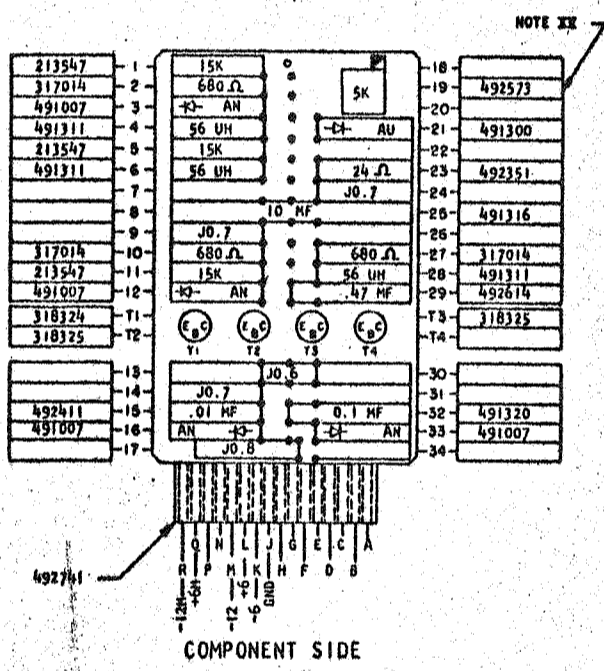
ALLOY UNIVERSAL DELAY CIRCUIT



SEQUENCE OF OPERATION

1. ALL INPUTS UP ALL TRANSISTORS ARE ON OUTPUT IS DOWN
2. ANY DOWN INPUT WILL CAUSE T3 TO GO OFF; T1 AND T2 WILL REMAIN ON UNTIL RC CAPACITOR IS CHARGED. WHEN THE CAPACITOR IS CHARGED T1 AND T2 WILL BE OFF AND THE OUTPUT WILL BE UP

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS		
			MIN	MAX	
B U	INPUT		UP	-5.26	0.24
			DOWN	-7.44	-12.5
P U	INPUT		UP	-5.26	0.24
			DOWN	-7.44	-12.5
M T	OUTPUT		UP	1.44	6.24
			DOWN	-5.46	-6.24
B	EXTENDER INPUT		UP		-6
			DOWN		-12



CIRCUIT AND PACKAGING STANDARDS	
APPROVAL	DATE
ABC	4-2-62

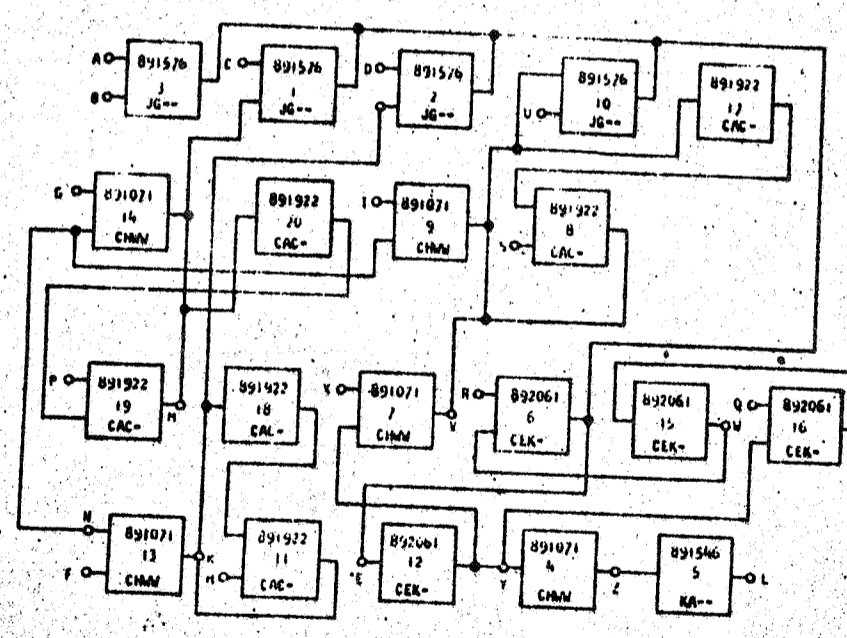
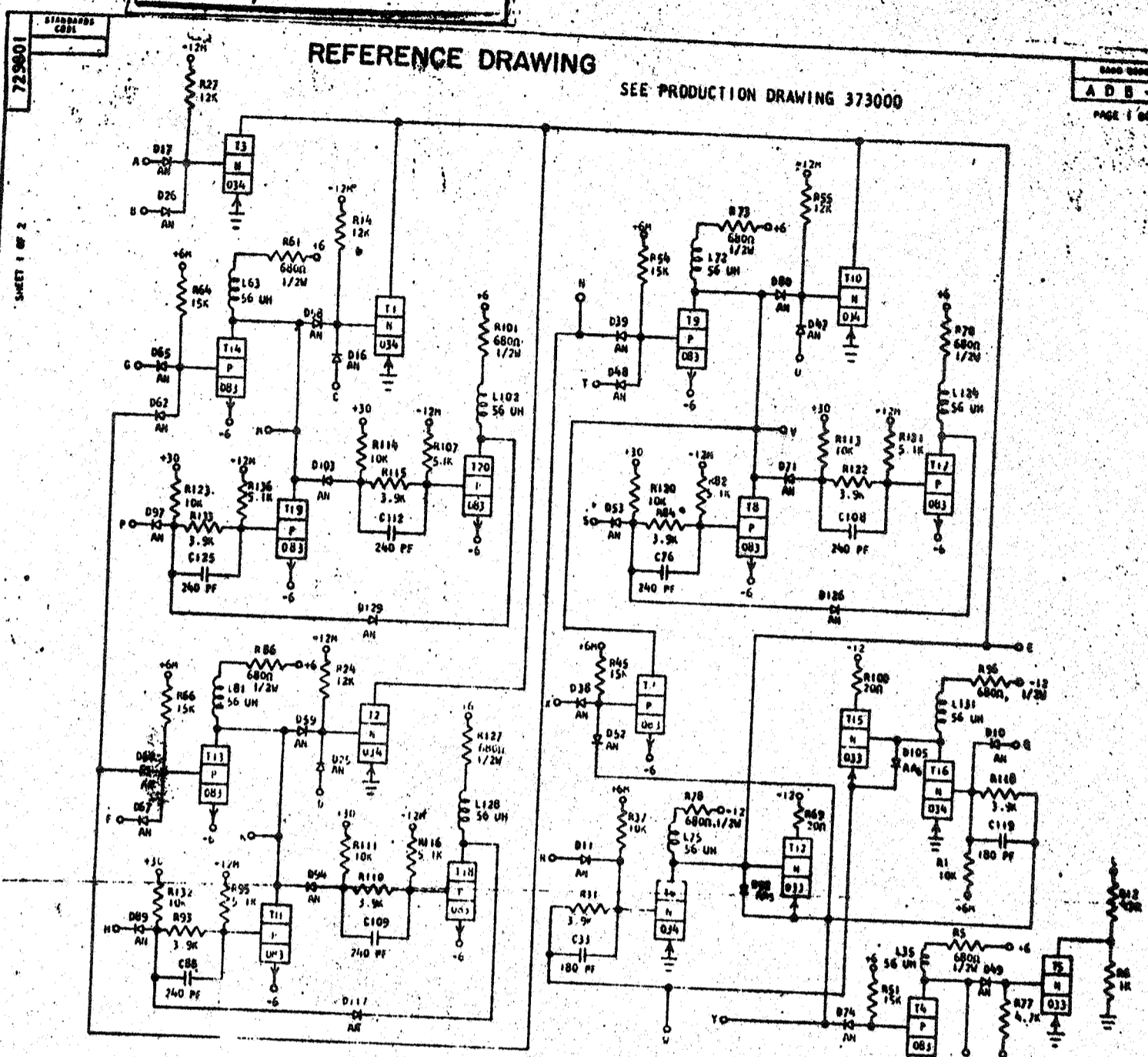
INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM YSTR - ALLOY				4-2-62	115599					729800
UNIVERSAL DELAY CIRCUIT										
DESIGN	RQ	3-1-62	SCALE	NONE						
CHECK	WN	3-1-62	DRAW	LIG	3-17-62					
APPRO			CHECK							

729800

REFERENCE DRAWING

SEE PRODUCTION DRAWING 373000

72901
 ADB -
 PAGE 1 OF 2



VOLTAGE
 GROUND
 -6
 -12
 +12
 +30
 +6N
 -12N

- SEQUENCE OF OPERATION
1. THE ONE AND TWO DIGIT NUMBERS SHOWN IN THE INDIVIDUAL BLOCKS OF THE BLOCK DIAGRAM REFER TO A TRANSISTOR OF THE SAME NUMBER IN THE DETAILED SCHEMATIC
 2. THE 800,000 SERIES NUMBER IN EACH BLOCK REFERS TO THE ENGINEERING SPECIFICATION FOR THAT PARTICULAR CIRCUIT
 3. THE CARD AND CAP CODE IN EACH BLOCK REFERS TO THE RESPECTIVE PORTION OF THE DETAILED CIRCUITRY
 4. FOR INFORMATION PERTAINING TO WAVE FORMS OF EACH INDIVIDUAL CIRCUIT, REFER TO THE CARD AND CAP CODE OF THE CIRCUIT

CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
STORAGE ADDRESS REGISTER				1-62	115559					
DETAILS										
DESIGN										
CHECKED										
DRAWN										
ENGR.										
MATERIAL										
TESTING										
REVISIONS										

C

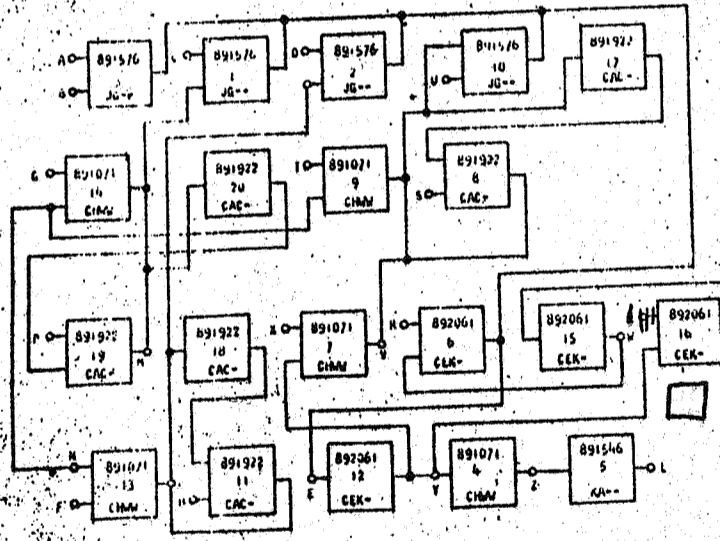
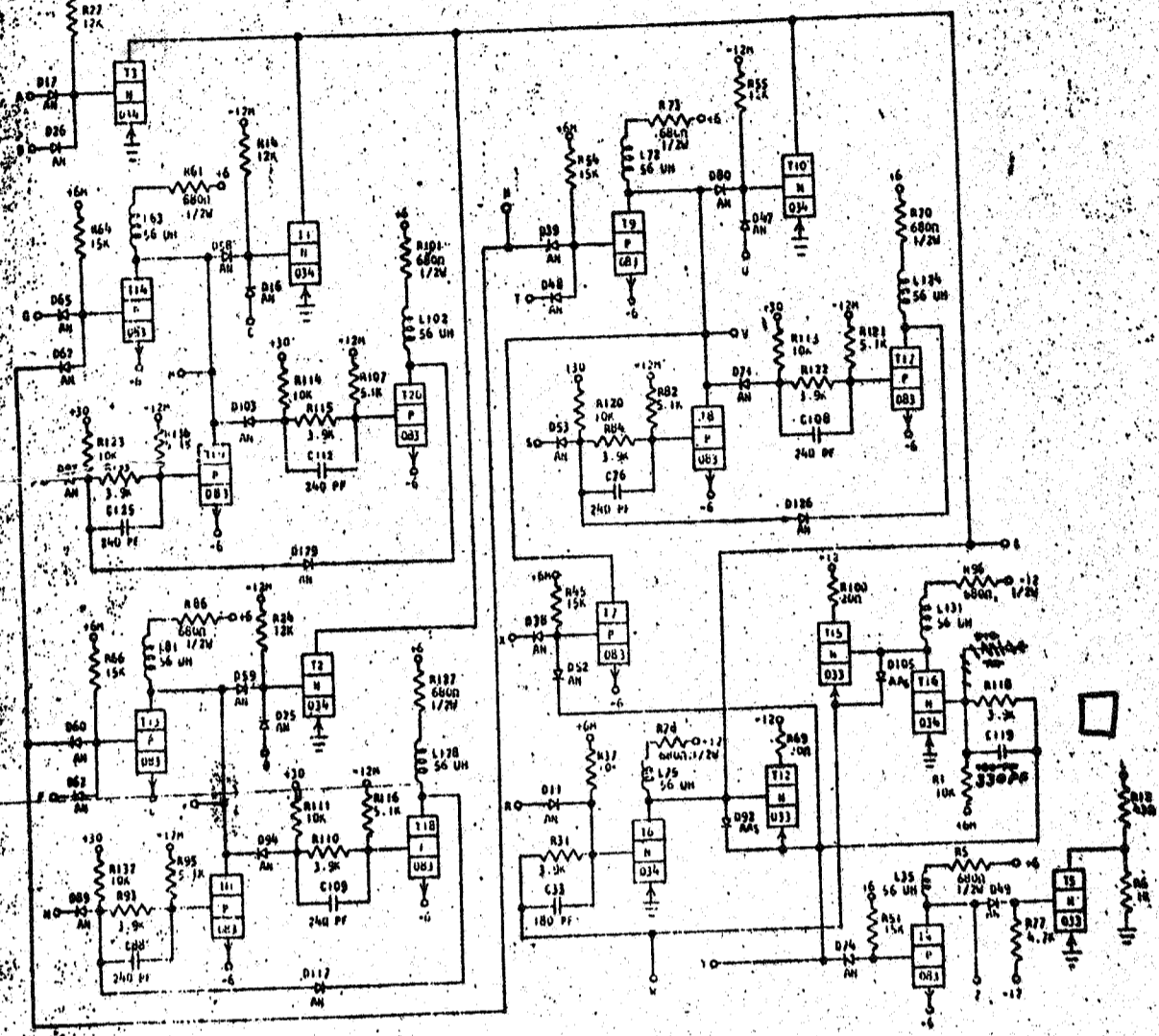
72901

SHEET OF EC 11473B

REFERENCE DRAWING

SEE PRODUCTION DRAWING 373000

CARD CODE 729501
A D B -
PAGE 1 OF 2



- VOLTAGE
GROUND
-6
-12
-18
+30
+60
-120
- PIN
1
2
3
4
5
6
7
8
9
10
11
12
- SEQUENCE OF OPERATION
1. THE ONE AND TWO DIGIT NUMBERS SHOWN IN THE INDIVIDUAL BLOCKS OF THE BLOCK DIAGRAM REFER TO A TRANSISTOR OF THE SAME NUMBER IN THE DETAILED SCHEMATIC
 2. THE 800,000 SERIES NUMBER IN EACH BLOCK REFERS TO THE ENGINEERING SPECIFICATION FOR THAT PARTICULAR CIRCUIT
 3. THE CARD AND CAP CODE IN EACH BLOCK REFERS TO THE RESPECTIVE PORTION OF THE DETAILED CIRCUITRY
 4. FOR INFORMATION PERTAINING TO WAVE FORMS OF EACH INDIVIDUAL CIRCUIT, REFER TO THE CARD AND CAP CODE OF THE CIRCUIT

CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.		CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DATE
1	11473B						
2							
3							
4							
5							

729801

STANDARDS CODE

REFERENCE DRAWING

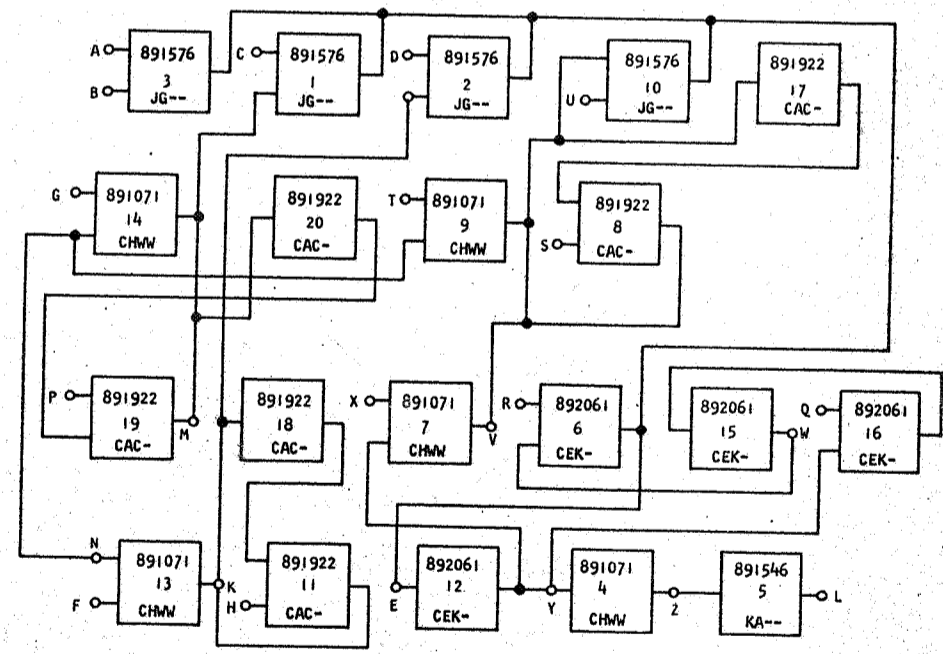
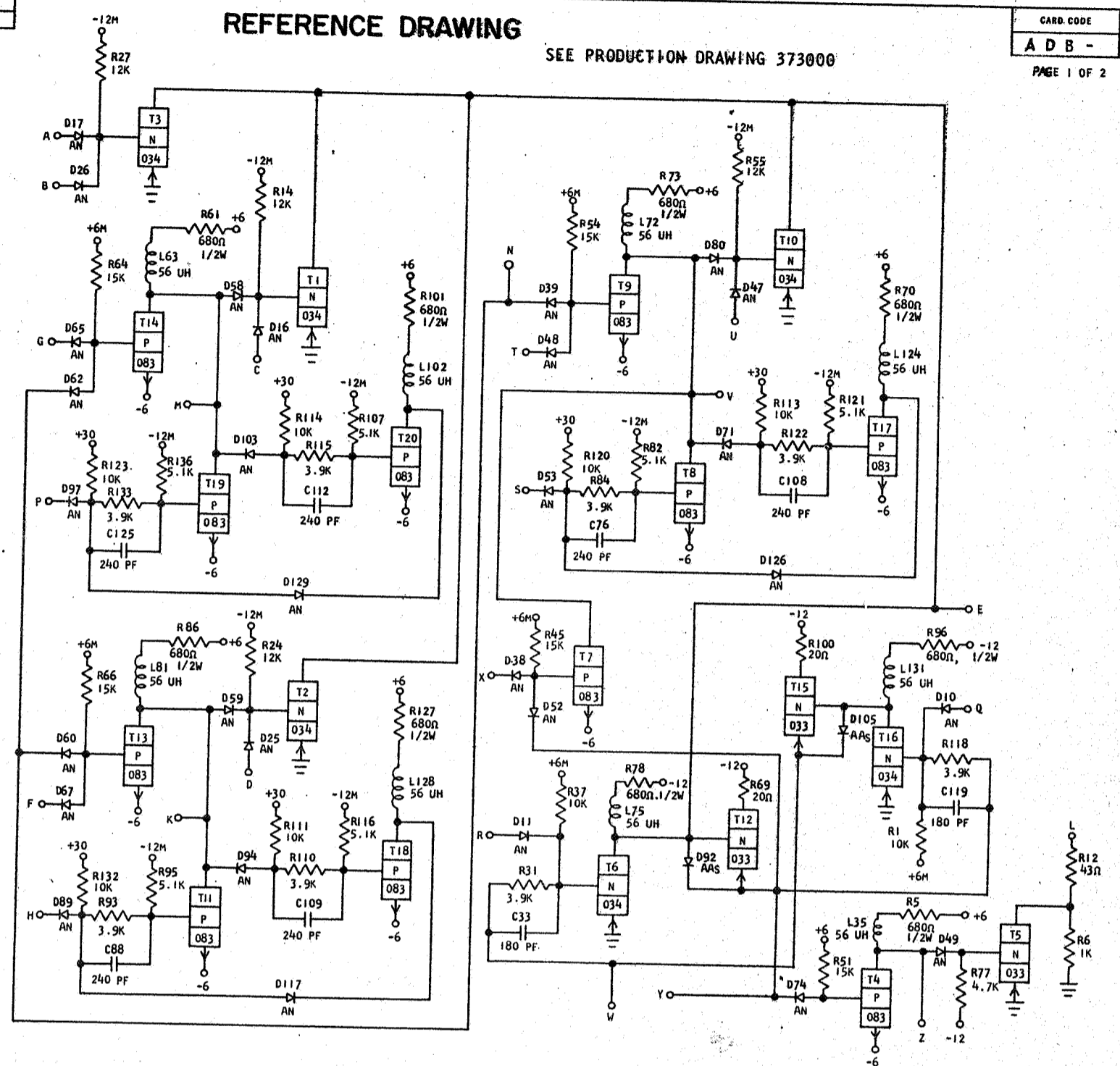
SEE PRODUCTION DRAWING 373000

CARD CODE 729801

A D B -

PAGE 1 OF 2

SHEET 1 OF 2



VOLTAGE	
GROUND	
-6	
+6	
-12	
+30	
+6M	
-12M	

PIN	
1	
2	
3	
4	
5	
7	
8	

SEQUENCE OF OPERATION

1. THE ONE AND TWO DIGIT NUMBERS SHOWN IN THE INDIVIDUAL BLOCKS OF THE BLOCK DIAGRAM REFER TO A TRANSISTOR OF THE SAME NUMBER IN THE DETAILED SCHEMATIC
2. THE 800,000 SERIES NUMBER IN EACH BLOCK REFERS TO THE ENGINEERING SPECIFICATION FOR THAT PARTICULAR CIRCUIT
3. THE CARD AND CAP CODE IN EACH BLOCK REFERS TO THE RESPECTIVE PORTION OF THE DETAILED CIRCUITRY
4. FOR INFORMATION PERTAINING TO WAVE FORMS OF EACH INDIVIDUAL CIRCUIT, REFER TO THE CARD AND CAP CODE OF THE CIRCUIT

CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME TWIN CARD ASSEMBLY- ALLOY				1-62	115599					729801
STORAGE ADDRESS REGISTER										
DESIGN	CJ	3-1-62	SCALE	NONE						
CHECK	WH	3-1-62	DRAW	LIG 3-17-62						
APPRO			CHECK							

729801

STANDARD CASE

REFERENCE DRAWING

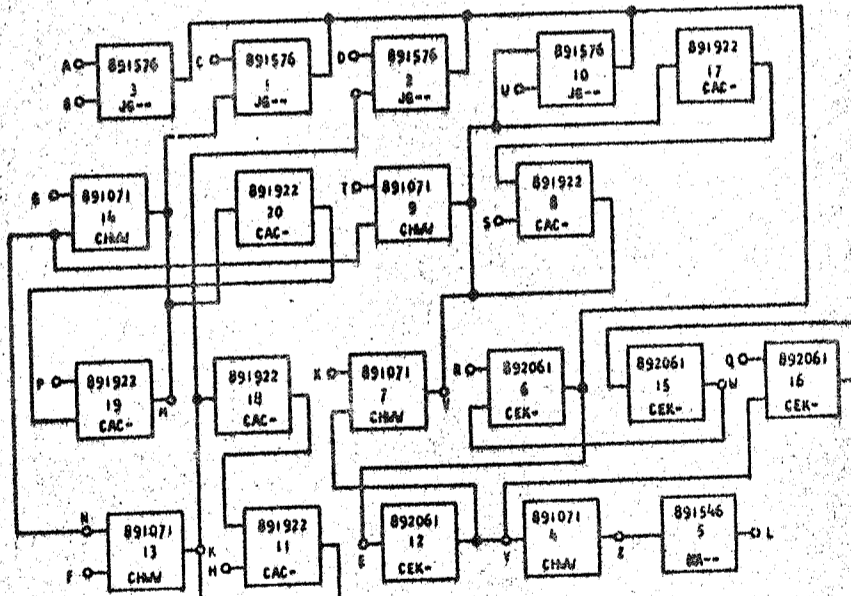
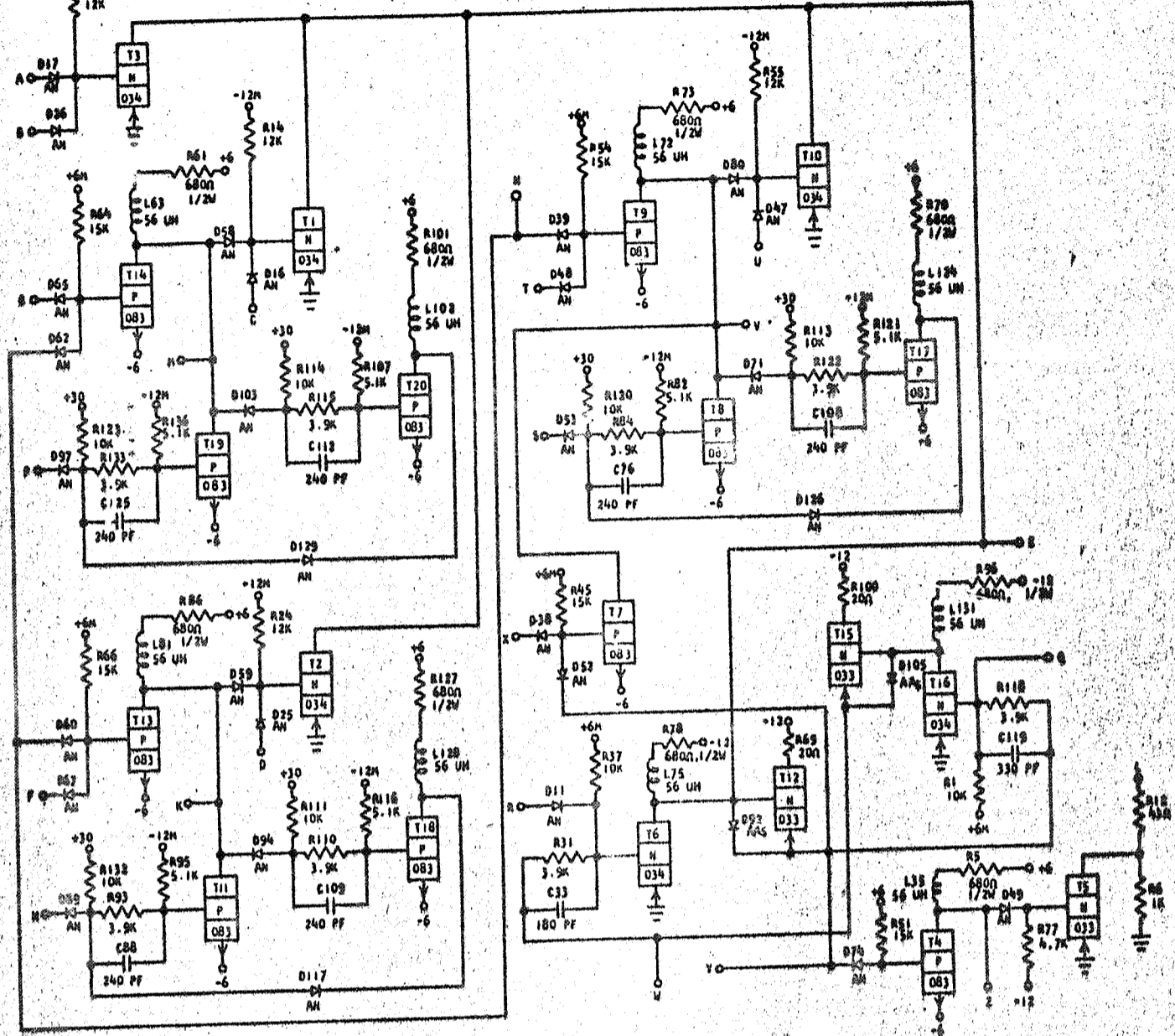
SEE PRODUCTION DRAWING 373000

729801

A D B -

PAGE 1 OF 3

SHEET 1 OF 2



VOLTAGE
GROUND
-6
-12
-13
+30
+6V
-12V

SEQUENCE OF OPERATION

1. THE ONE AND TWO DIGIT NUMBERS SHOWN IN THE INDIVIDUAL BLOCKS OF THE BLOCK DIAGRAM REFER TO A TRANSISTOR OF THE SAME NUMBER IN THE DETAILED SCHEMATIC
2. THE 800,000 SERIES NUMBER IN EACH BLOCK REFERS TO THE ENGINEERING SPECIFICATION FOR THAT PARTICULAR CIRCUIT
3. THE CARD AND CAP CODE IN EACH BLOCK REFERS TO THE RESPECTIVE PORTION OF THE DETAILED CIRCUITRY
4. FOR INFORMATION PERTAINING TO WAVE FORMS OF EACH INDIVIDUAL CIRCUIT, REFER TO THE CARD AND CAP CODE OF THE CIRCUIT

CIRCUIT AND PACKAGING STANDARDS	
APPROVAL	DATE
ABC	4-2-62

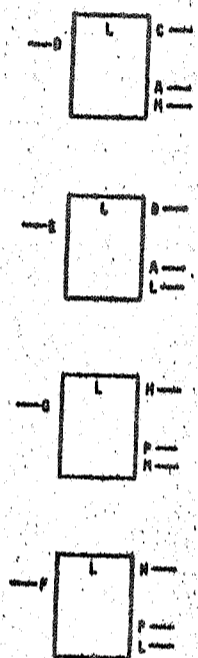
INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHARGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME TWIN CARD ASSEMBLY - ALLOY	4-29-62	115599					729801
STORAGE ADDRESS REGISTER	9-6-62	8113560	MPL				
DESIGN	11-13-62	114730					
DETAIL NO 3-1-62 SCALE NONE	1-9-63	EC 8116088					
CHECK MM 3-1-62 DRAW L18 3-17-62	3-4-63	JT 83667					

729801

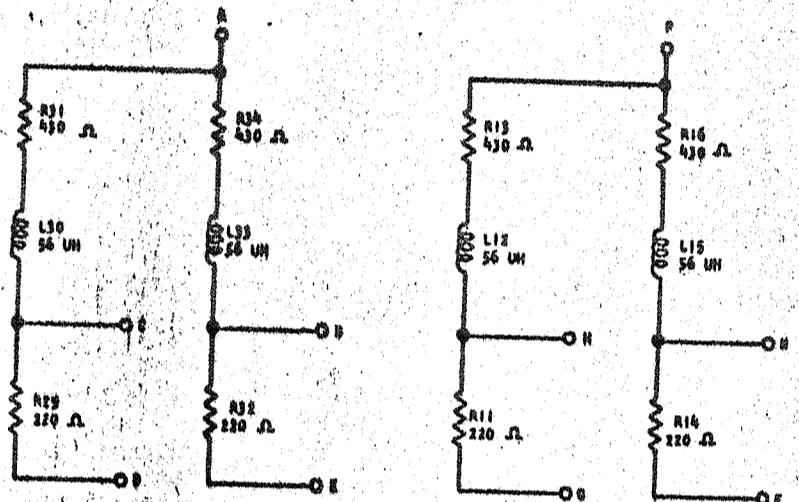
729802

CARD CODE 729802
A E A -

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371929

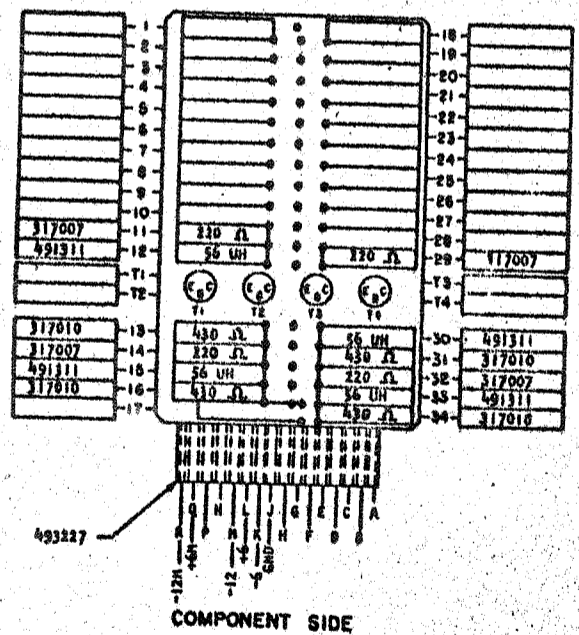


CTRL LOAD CARD



SEQUENCE OF OPERATION

1. AS COLLECTOR LOAD FOR CTRL BLOCK TO PROVIDE CURRENT MODE OUTPUT
2. A AND P CONNECTED TO +6 VOLTS; B, E, G, F ARE Y LEVEL INPUTS AND C, D, H, N ARE N LEVEL OUTPUTS
3. A AND P CONNECTED TO -12 VOLTS; B, E, G, F ARE U LEVEL INPUTS AND C, D, H, N ARE P LEVEL OUTPUTS



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASH YSTR-CTRL				4-62	115599					729802
LOAD CARD										
DESIGN	REV	MODEL	SMS							
DETAIL	NO	3-1-62	SCALE	NONE						
CHECK	NO	3-1-62	DRAW	L18	3-1-62					
APPRO			CHECK							

729802

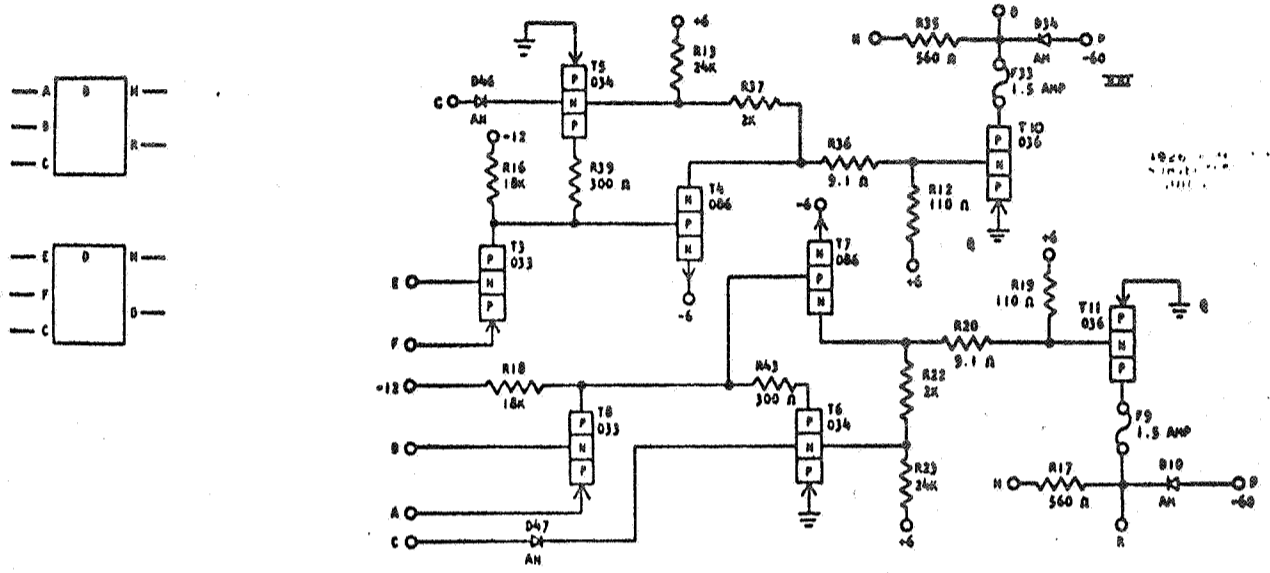
729803

STANDARD CODE

SARD CODE 729803
A E C -

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371940

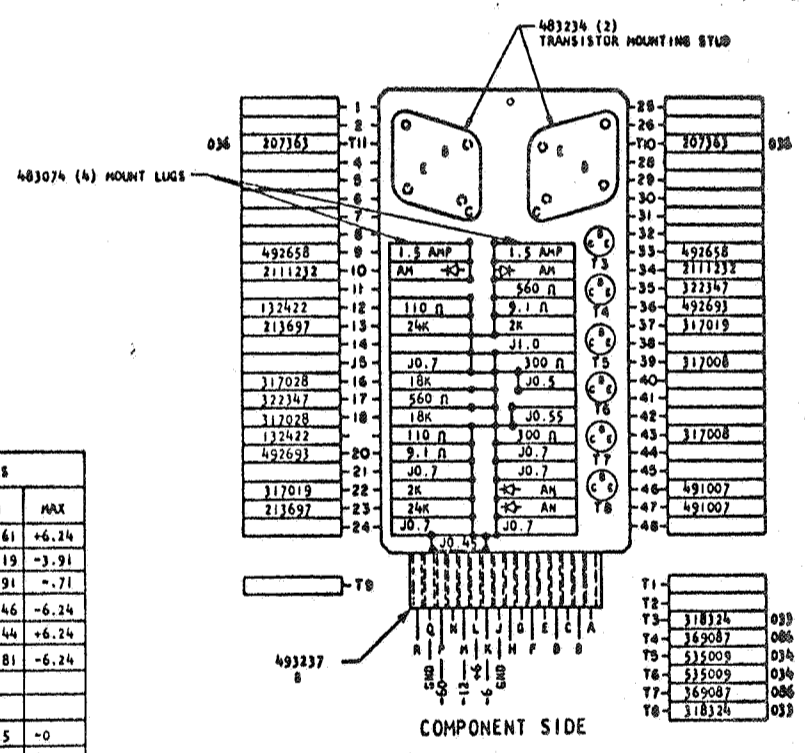
ALLOY HAMMER DRIVER LATCH



SEQUENCE OF OPERATION

1. WHEN INPUTS AT E (GATE) AND F (SET) ARE IN COINCIDENCE T3 TURNS ON
2. WITH T3 ON, T4 TURNS ON, T5 TURNS ON AND LATCHES T6
3. T10 TURNS ON THE OUTPUT IS GND
4. WHEN C (RESET) IS UP T5, T6, T10 TURN OFF AND THE OUTPUT IS -60V
5. FAILURE TO RESET PROPERLY WILL RESULT IN BLOWN FUSE

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
E, B	N GATE		UP +5.61	+6.24
A, F	Y SET		UP -3.91	-7.71
C	Y RESET		UP +1.44	+6.24
M, N		HAMMER CHECK DRIVE	UP	
D, R	V OUTPUT		UP -2.5	-0
			DOWN	
			DOWN	-54
				-60



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME: CARD ASM TSTR -				6-27-62	115599					729803
ALLOY HAMMER DRIVER LATCH				9-18-62	EC 112467	MBL				
DESIGN	RQ	3-1-62	SCALE	NONE	30-4-63	JT 83687				
CHECK	WH	3-1-62	DRAW	LIG	3-7-62					
APPROV			CHECK							

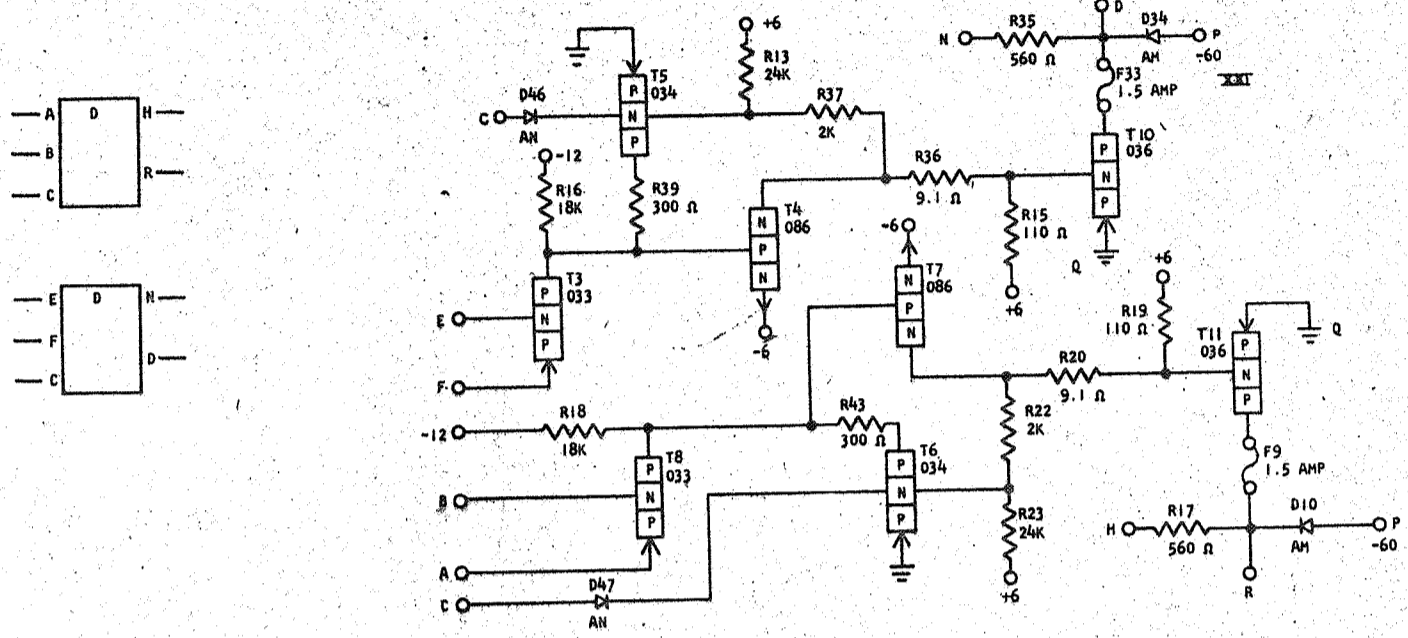
EC 112467

STANDARDS CODE

CARD CODE 729803
A E C -

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371940

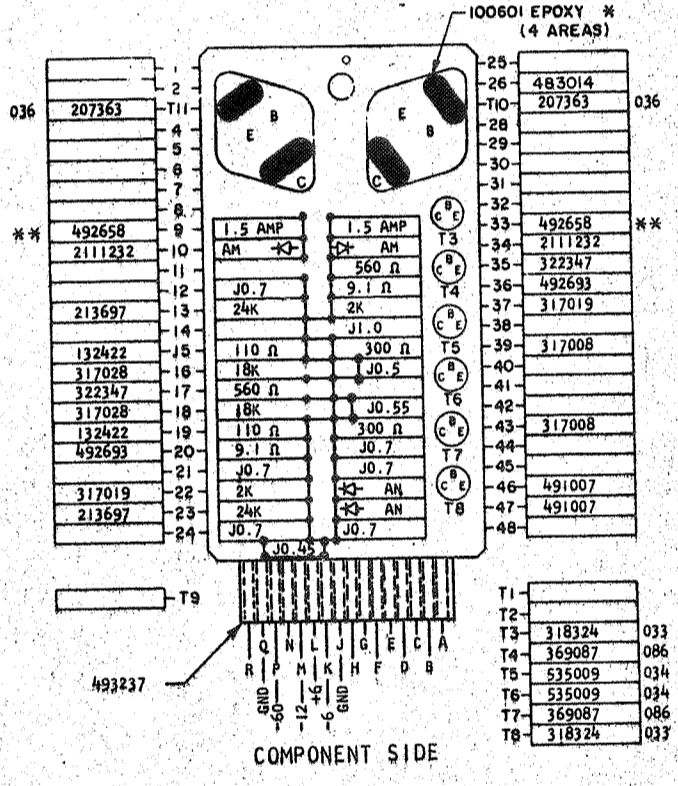
ALLOY HAMMER DRIVER LATCH



SEQUENCE OF OPERATION

1. WHEN INPUTS AT E (GATE) AND F (SET) ARE IN COINCIDENCE T3 TURNS ON
2. WITH T3 ON, T4 TURNS ON, T5 TURNS ON AND LATCHES T4
3. T10 TURNS ON THE OUTPUT IS GND
4. WHEN C (RESET) IS UP T5, T4, T10 TURN OFF AND THE OUTPUT IS -60V
5. FAILURE TO RESET PROPERLY WILL RESULT IN BLOWN FUSE

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
E, B	N GATE	[Waveform]	UP +5.61	+6.24
			DOWN -1.19	-3.91
A, F	T SET	[Waveform]	UP -3.91	-7.1
			DOWN -5.46	-6.24
C	T RESET	[Waveform]	UP +1.44	+6.24
			DOWN -.81	-6.24
H, N		HAMMER CHECK DRIVE	UP	
			DOWN	
R, R	V OUTPUT	[Waveform]	UP -2.5	-0
			DOWN -54	-60



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR - ALLOY HAMMER DRIVER LATCH	6-11-62	115599					729803
DESIGN							
DETAIL RQ 3-1-62	SCALE	NONE					
CHECK WH 3-1-62	DRAW	LIG 3-17-62					
APPRO	CHECK						

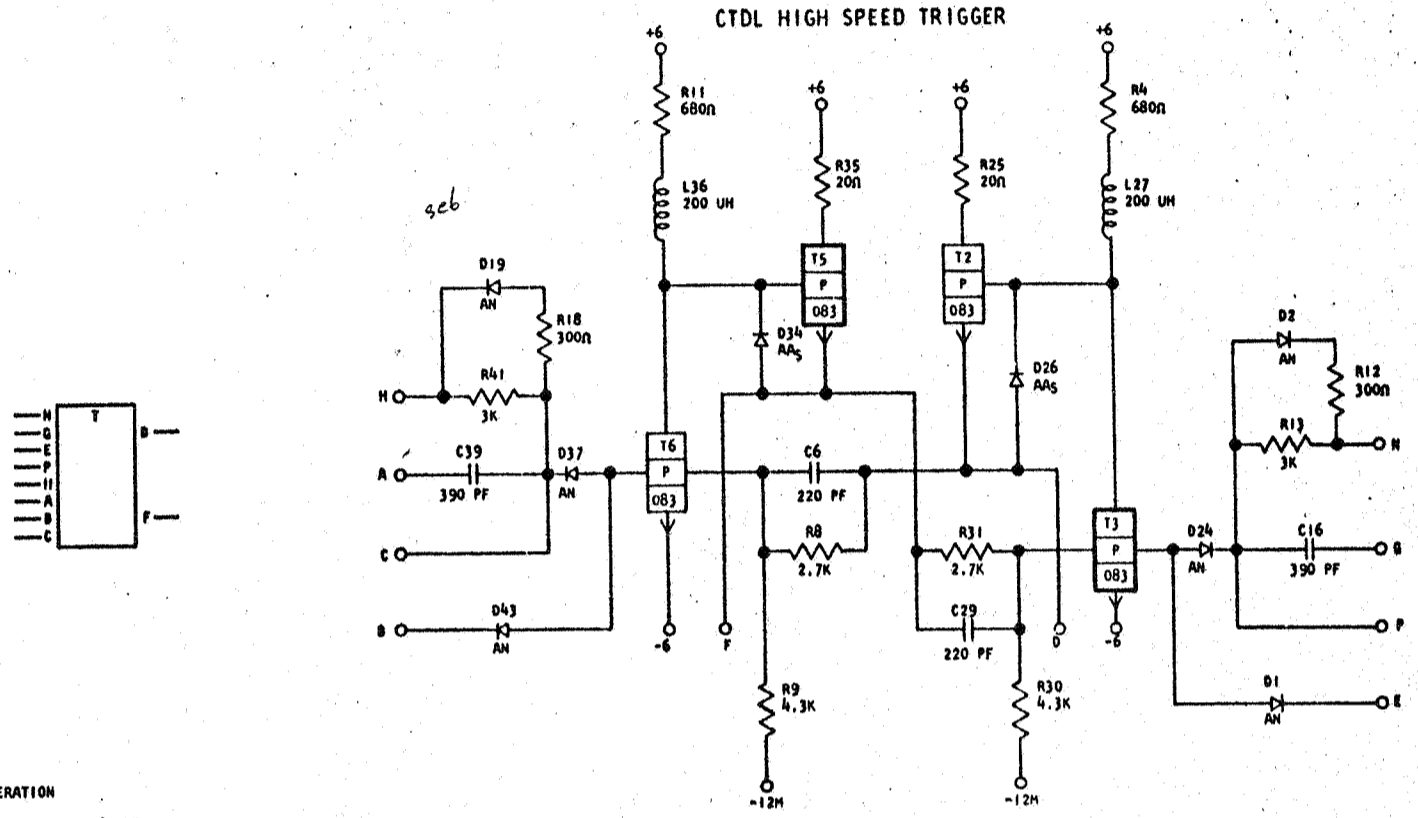
729804

STANDARDS CODE

CARD CODE 729804
A E D -

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371946

CTDL HIGH SPEED TRIGGER



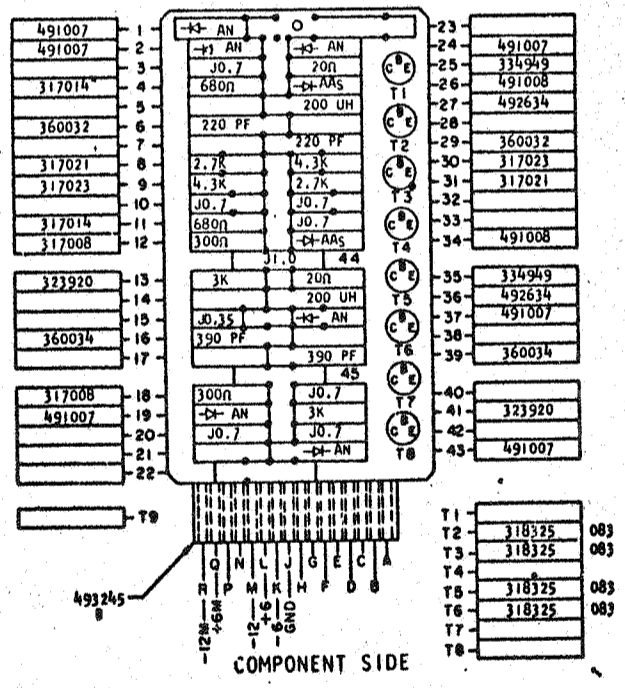
SEQUENCE OF OPERATION

1. T3 AND T5 ON, T2 AND T6 OFF
2. PIN N MUST BE CONDITIONED TO A DOWN LEVEL 0.58 U SEC. BEFORE A NEGATIVE SHIFT IS APPLIED TO PIN G FOR A UP LEVEL AT D AND DOWN LEVEL AT F
3. TO FLIP TRIGGER TO ORIGINAL STATE PIN H AND A MUST BE CONDITIONED AS WERE PINS N AND G
4. DOWN INPUT AT B WILL RESET TRIGGER TO CONDITION 1 AND DOWN INPUT AT E WILL RESET TRIGGER TO CONDITION 2
5. P AND C ARE EXTENDER INPUTS

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
A, G	U SET	[Waveform]	UP - .54	+ .24
			DOWN -7.44	-12.5
N	T GATE	[Waveform]	UP 3.85	6.24
			DOWN -4.46	-6.24
H	T GATE	[Waveform]	UP 3.85	6.24
			DOWN -4.46	-6.24
D	T OUTPUT	[Waveform]	UP 3.85	6.24
			DOWN -4.46	-6.24
F	T OUTPUT	[Waveform]	UP 3.85	6.24
			DOWN -4.46	-6.24
E	U RESET	[Waveform]	UP - .54	+ .24
			DOWN -7.44	-12.5

DELAY - USEC

1. DELAY FROM INPUT TO OUTPUT OF OFFSIDE (LOADED)
 - DRIVING CTDL LOADS: T ON .14 MIN .16 MAX
 - T OFF .08 MIN .35 MAX
 - DRIVING HI SPEED MESA: T ON .05 MIN .17 MAX
 - T OFF .1 MIN .51 MAX
2. DELAY FROM INPUT TO ONSIDE (UNLOADED)
 - DRIVING HI SPEED DTDL MESA: T ON .13 MIN .51 MAX
 - T OFF .08 MIN .14 MAX
 - DRIVING CTDL LOADS: T ON .11 MIN .38 MAX
 - T OFF .08 MIN .11 MAX



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD ASM TSTR - CTDL	DATE	6-27-62	EC 115599						
	HIGH SPEED TRIGGER	DATE	30.4.63	TT 83687						
DESIGN	RQ	3-1-62	SCALE	NONE						
CHECK	WH	3-1-62	DRAW	LIG 3-17-62						
APPRO			CHECK							

729804

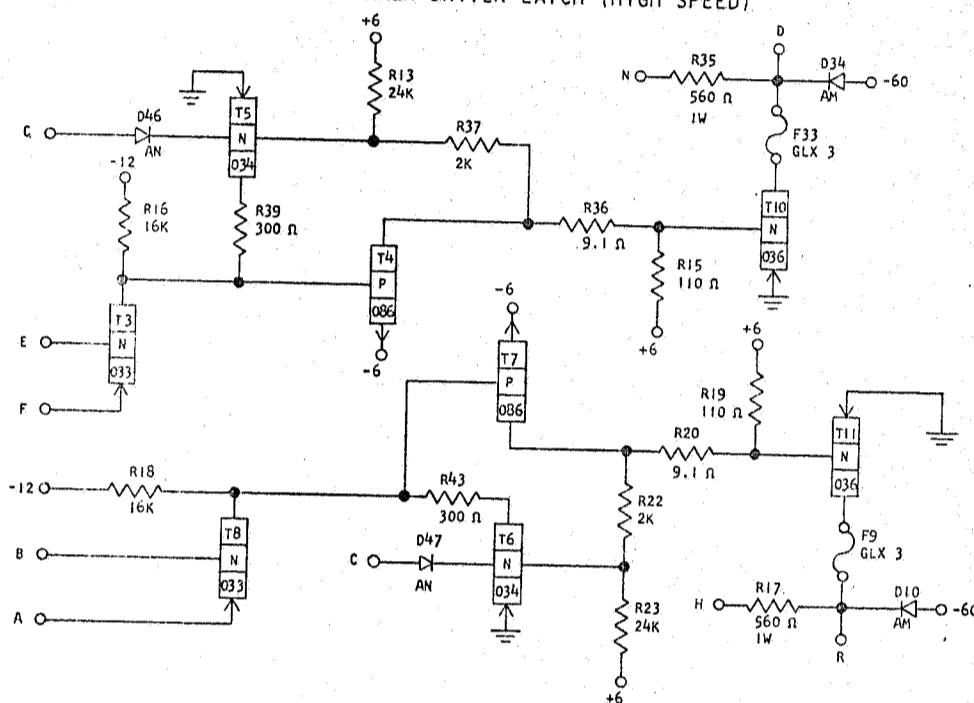
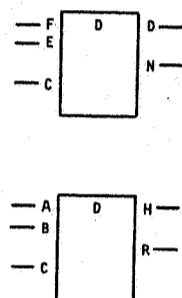
STANDARDS CODE
729805

CARD CODE 729805
A E N -

REFERENCE DRAWING

SEE PRODUCTION DRAWING 371415

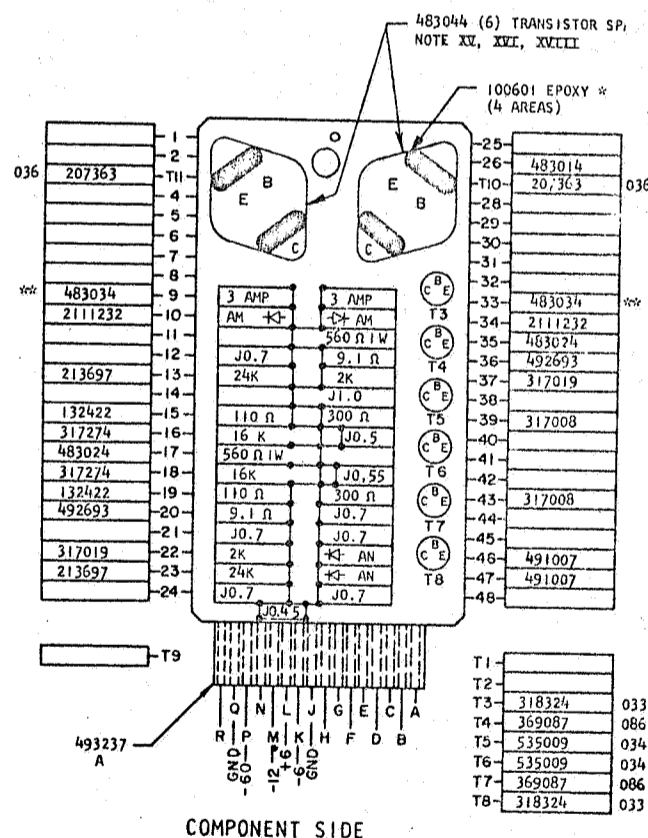
ALLOY HAMMER DRIVER LATCH (HIGH SPEED)



SEQUENCE OF OPERATION

1. WHEN INPUTS AT E (GATE) AND F (SET) ARE IN COINCIDENCE T3 TURNS ON
2. WITH T3 ON, T4 TURNS ON, T5 TURNS ON, AND LATCHES T4
3. T10 TURNS ON, THE OUTPUT IS GROUND
4. WHEN C (RESET) IS UP, T5 TURNS OFF, T4 TURNS OFF, T10 TURNS OFF AND THE OUTPUT IS -60V

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
F, A	T SET	[Square Wave]	UP -3.91	-71
E, B	N GATE	[Square Wave]	UP 5.71	6.24
C	T RESET	[Square Wave]	UP 1.44	6.24
N, H	HAMMER CHECK DRIVE	[Square Wave]	UP	
R, D	V OUTPUT	[Square Wave]	UP -2.5	0
			DOWN -54	-60



COMPONENT SIDE

CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

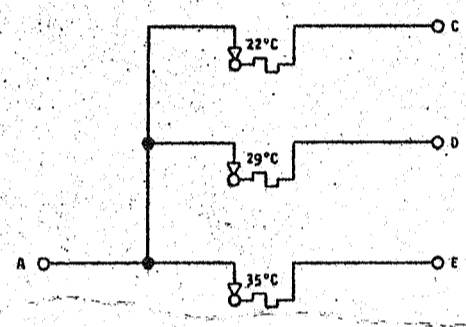
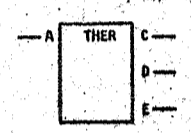
INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD ASM TSTR - ALLOY HAMMER DRIVER LATCH (HIGH SPEED)	6-7-62	115599					729805
DESIGN	RQ 3-1-62	MODEL	SMS					
DETAIL	WH 3-1-62	SCALE	NONE					
CHECK	LIG 3-17-62	DRAW						
APPRO		CHECK						

STANDARDS CODE
729806

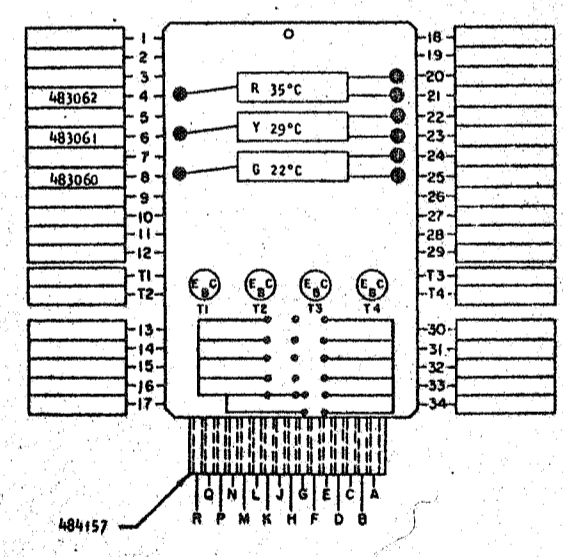
CARD CODE 729806
A K B -

REFERENCE DRAWING
SEE PRODUCTION DRAWING 370425

ALLOY-MEMORY THERMAL SWITCHES



1. CARD CONTROLS DRIVE CURRENT BY DECREASING CURRENT FOR AN INCREASE IN MEMORY AMBIENT TEMPERATURE



COMPONENT SIDE

CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME: CARD ASM TSTR -ALLOY- MEMORY THERMAL SWITCHES	6-1-62	115599					
DESIGN: [] MODEL: SMS							
DETAIL: RQ 3-1-62 SCALE: NONE							
CHECK: WH 3-1-62 DRAW: LIG 3-17-62							
APPRO: [] CHECK: []							

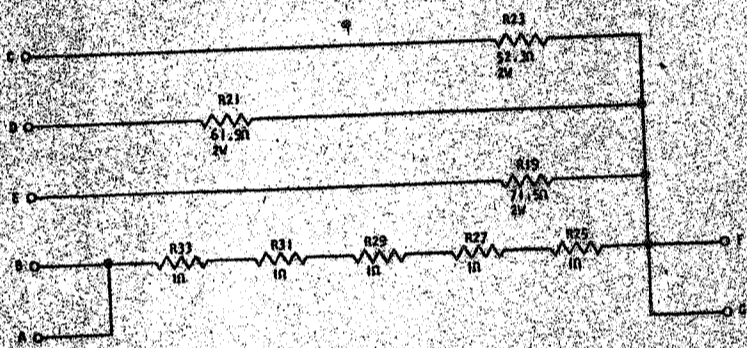
729806

729807

729807
A K C

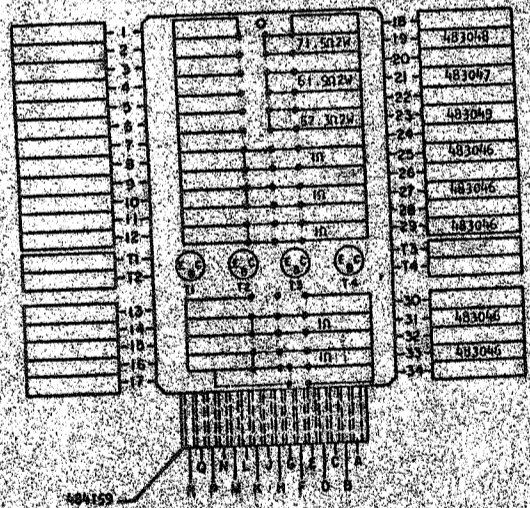
REFERENCE DRAWING
SEE PRODUCTION DRAWING 370426

MEMORY EMITTER RESISTORS



SEQUENCE OF OPERATION

- 1. CARD CONTAINS PORTION OF EMITTER RESISTANCE OF A MEMORY CONSTANT CURRENT DRIVE SOURCE
- 2. RESISTORS LOCATED BETWEEN EMITTER AND EMITTER RETURN VOLTAGE ARE SWITCHED OUT OF CIRCUIT AS TEMPERATURE INCREASES



COMPONENT SIDE

CIRCUIT AND FACTORING STANDARDS	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	ISSUE NO.	APPROVAL	DEVELOPMENT NO.
MEMO CARD ASM. WITH MEMORY	3-27-62	1					729807
EMITTER RESISTORS							
DESIGNED BY							
CHECKED BY							
TESTED BY							

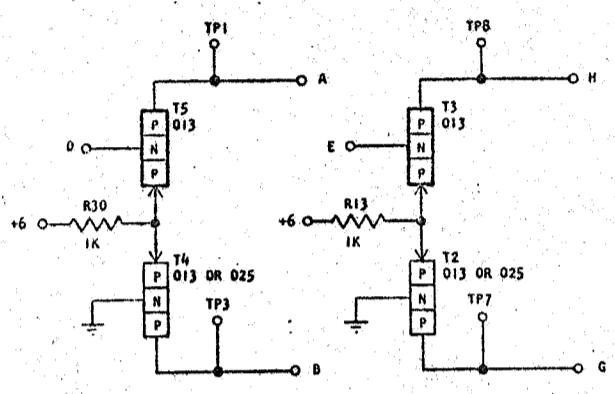
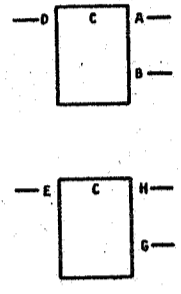
729807

729808
STANDARD CODE

CARD CODE 729808
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REFERENCE DRAWING
SEE PRODUCTION DRAWING 371203

ALLOY-ONE WAY "N" BLOCK



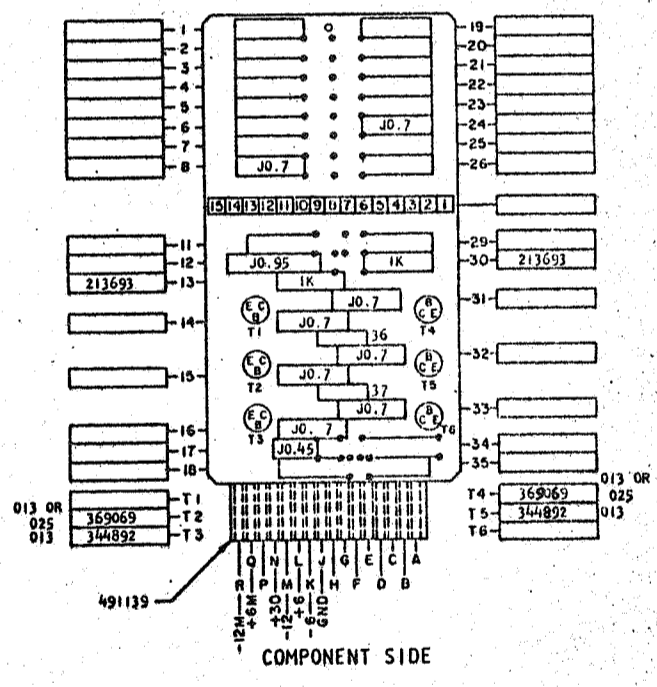
- SEQUENCE OF OPERATION
1. INPUT DOWN T5, T3 ON; T4, T2 OFF
 2. INPUT UP T5, T3 OFF; T4, T2 ON
 3. IN & OUT OF PHASE OUTPUTS AVAILABLE
 4. COLLECTORS TIED TO COUPLING NETWORK

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
D, E	N	INPUT	UP	+0.4 - 3.0
			DOWN	-0.4 - -3.0
A, H	P	OUTPUT	UP	-5.6 - -3.0
			DOWN	-6.4 - -7.1
B, G	P	OUTPUT	UP	-5.6 - -3.5
			DOWN	-6.4 - -7.1

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	.17	.35
TURN OFF	.17	.35

NOTE: THE DELAYS WERE MEASURED AS THE TIME INTERVAL FROM THE CROSSING OF THE INPUT REFERENCE BY THE INPUT SIGNAL TO THE CROSSING OF THE OUTPUT REFERENCE BY THE OUTPUT SIGNAL.



CIRCUIT AND PACKAGING STANDARD

APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR-ALLOY-ONE	6-2-62	115599					729808
DESIGN							
DETAIL							
CHECK							
APPRO							

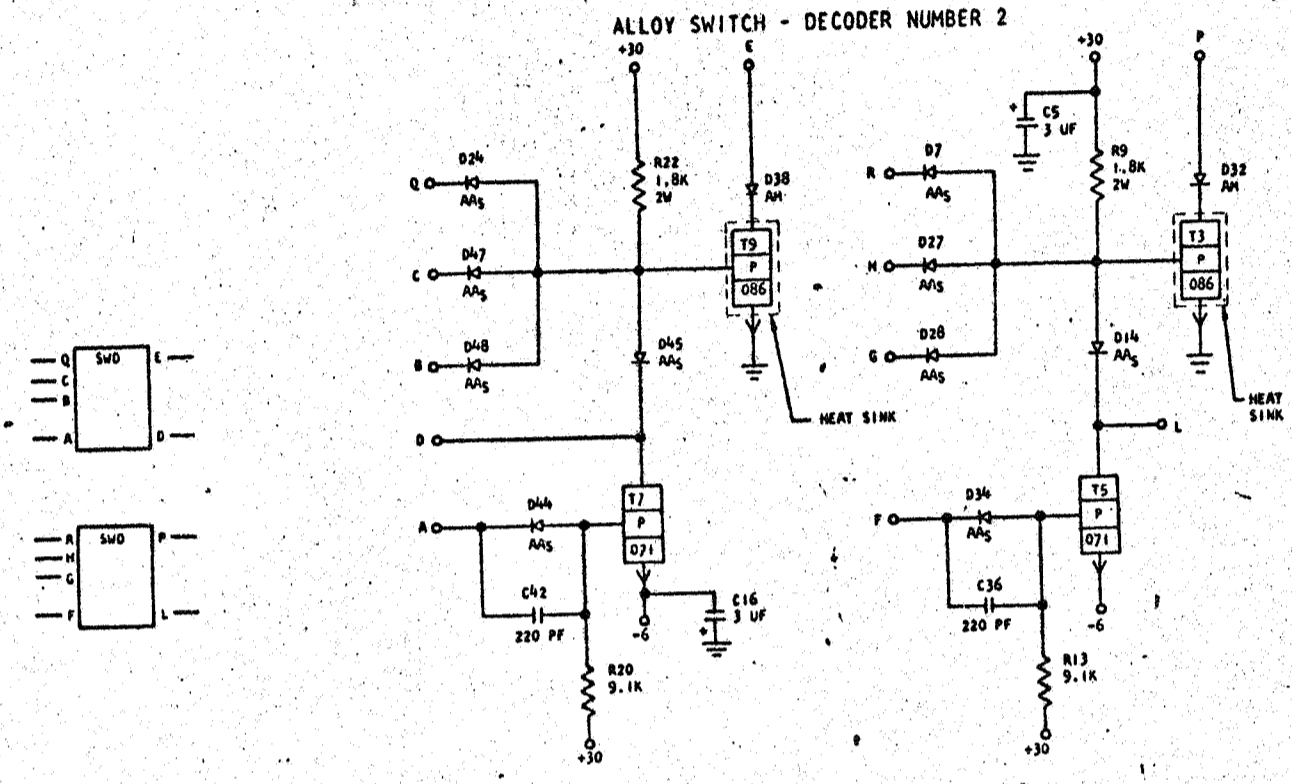
729808

729809
STANDARD CODE

729809
A Q U -

REFERENCE DRAWING
SEE PRODUCTION DRAWING 370833

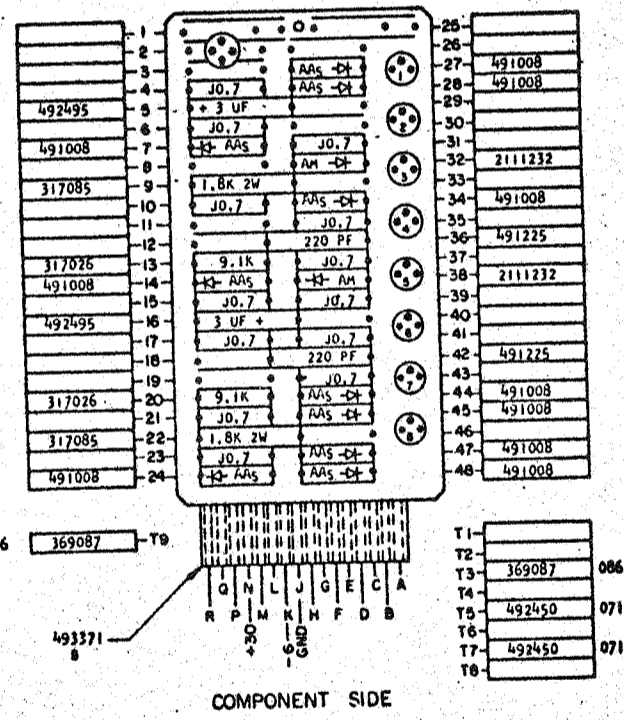
ALLOY SWITCH - DECODER NUMBER 2



- SEQUENCE OF OPERATION
1. UP INPUTS TO T9, DOWN INPUT T7, T9 ON, T7 OFF
MAX. CURRENT FLOWS IN T9
 2. UP INPUTS TO T9, UP INPUT T7, T9 OFF T7 ON MIN
CURRENT FLOWS IN T9
 3. T5, T3 CONDITIONED BY SAME SEQUENCE
 4. WHEN IN OFF CONDITION, OUTPUT ON T9 AND T3 WILL
REFLECT THE VOLTAGES INDUCED FROM COM'S.

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
A, F	U	INPUT	UP	-4.66 0.24
Q, R	T	INPUT	DOWN	-6.84 -12.5
C, H	T	INPUT	UP	1.74 14.76
B, G	T	INPUT	DOWN	-5.46 -6.24
D, L	T	OUTPUT	UP	1.74 14.76
E, P	Z	OUTPUT	DOWN	-5.46 -6.24
T3		INPUT	UP	0.74 0.24
T7		INPUT	DOWN	-1.14 -9.76

DELAY - USEC	MINIMUM	MAXIMUM
TURN ON	0.36	0.45
TURN OFF	0.36	0.45



COMPONENT SIDE

CIRCUIT AND PACKAGING STANDARDS	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR - ALLOY SWITCH, DECODER NUMBER 2		6-29-62	115599					
DESIGN	MODEL	SCALE						
DETAIL	3-1-62	NONE						
CHECK	3-1-62	DRAM	30.4.63	JT 83687				
APPRO	CHECK							

729809

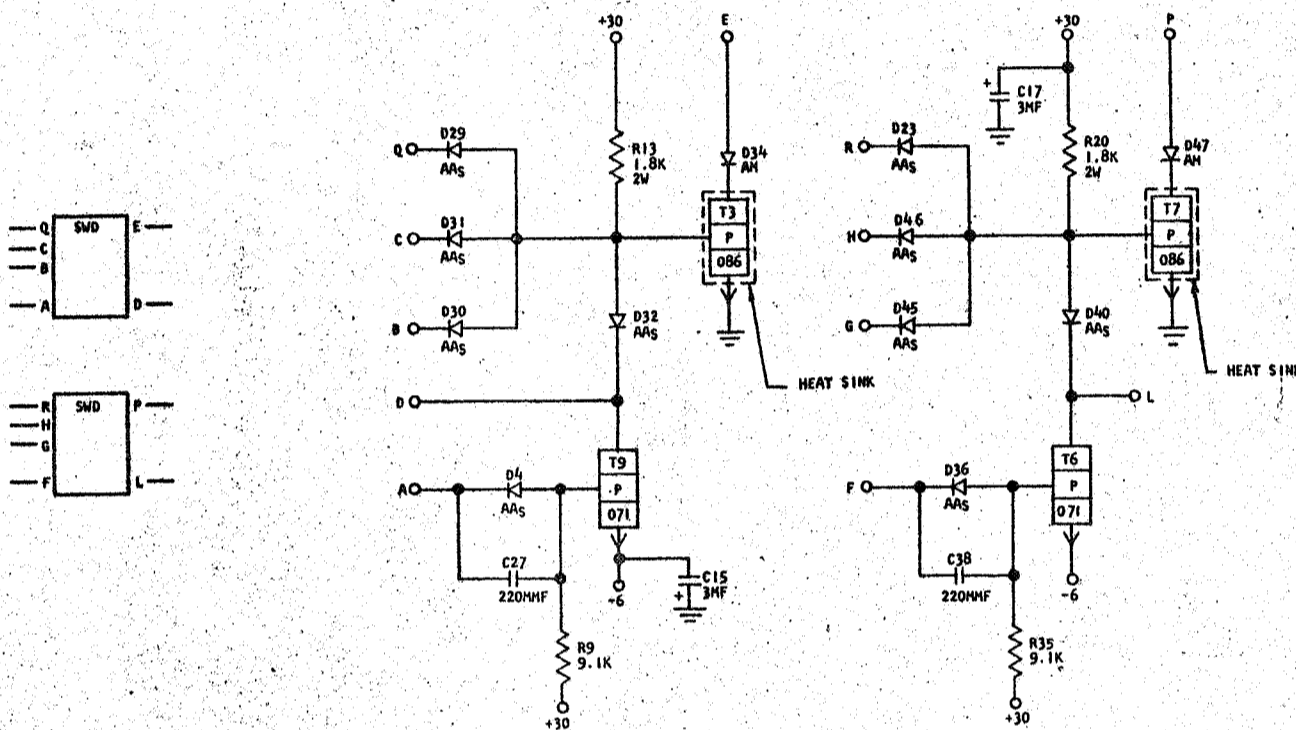
729809

STANDARDS CODE

CARD CODE 729809
A Q U -

REFERENCE DRAWING
SEE PRODUCTION DRAWING 370833

ALLOY SWITCH, DECODER NUMBER 2



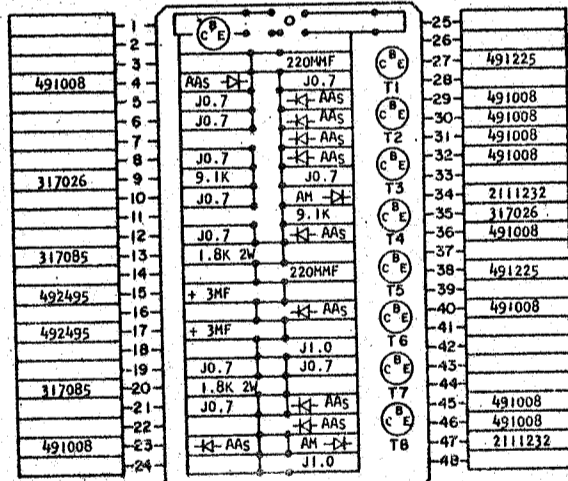
SEQUENCE OF OPERATION

1. UP INPUTS TO T3, DOWN INPUT T9, T3 ON, T9 OFF
MAX. CURRENT FLOWS IN T3
2. UP INPUTS TO T3, UP INPUT T9, T3 OFF T9 ON MIN
CURRENT FLOWS IN T3
3. T6, T7 CONDITIONED BY SAME SEQUENCE
4. WHEN IN OFF CONDITION, OUTPUT ON T3 AND T7 WILL
REFLECT THE VOLTAGES INDUCED FROM CORES.

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
A, F U	INPUT		UP -4.56	0.24
Q, R T	INPUT		UP 1.74	14.76
C, H T	INPUT		DOWN -5.46	-6.24
B, G T	INPUT		UP 1.74	14.76
D, L T	OUTPUT		UP 1.74	14.76
E, P Z	OUTPUT		DOWN -5.46	-6.24
T3 T7	INPUT		UP 0.74	0.24
			DOWN -1.14	-9.76

DELAY - USEC

TURN ON	MINIMUM	MAXIMUM
TURN OFF	----	0.36
	----	0.45



COMPONENT SIDE

CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR-ALLOY SWITCH		6-27-62	115599					729809
DECODER NUMBER 2								
DESIGN	MODEL	SMS						
DETAIL	RD	3-1-62	SCALE	NONE				
CHECK	WH	3-1-62	DRAW	LIG	3-17-62			
APPRO			CHECK					

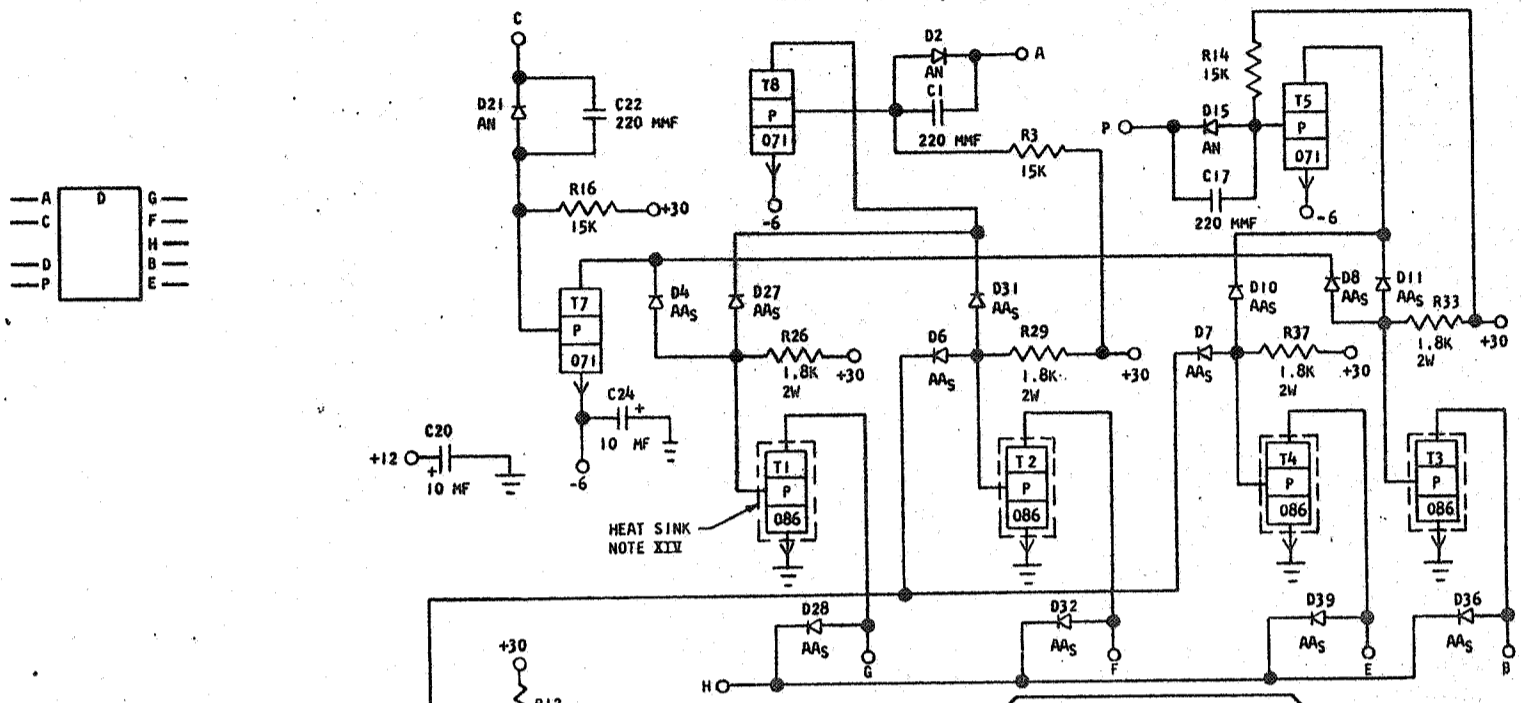
729809

729810
STANDARDS CODE

CARD CODE 729810
A Q V -

REFERENCE DRAWING
SEE PRODUCTION DRAWING 370834

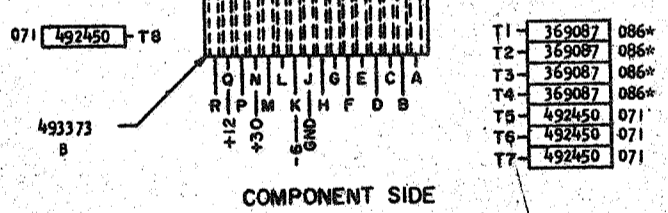
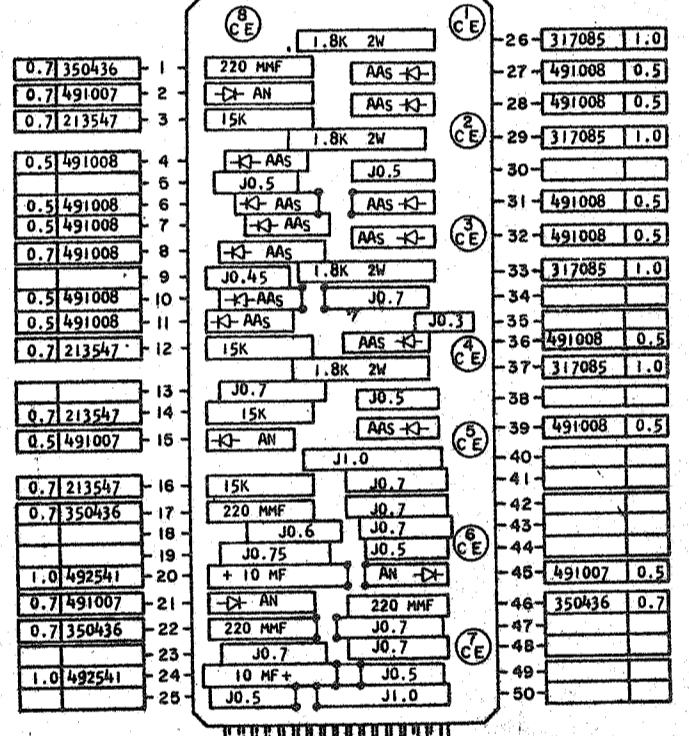
ALLOY-DRIVER, Z, 12 VOLTS



SEQUENCE OF OPERATION

- PIN H TIED TO Q (+12)
- WAVE SHAPE A T8, T5, T6, ON; T1, T2, T3, T4, T7 OFF
- DOWN INPUT AT A, T8 OFF T1 ON, OUTPUT AT G DOWN
- T7, T8 OFF, INPUT AT T1, +3. TO 4. VOLTS
- DELAYS FROM INPUT TO OUTPUT, MEASURED FROM -6 VOLT LEVEL ON INPUT TO +6 VOLT LEVEL ON OUTPUT.
TURN ON 0.9 USEC MAX
TURN OFF 0.35 USEC MAX

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
A	U INPUT	[Waveform]	UP -4.66	0.24
P	U INPUT	[Waveform]	DOWN -7.44	-12.5
C	U INPUT	[Waveform]	UP -4.66	0.24
D	U INPUT	[Waveform]	DOWN -7.44	-12.5
G	U OUTPUT	[Waveform]	UP +12	+12
F	U OUTPUT	[Waveform]	DOWN -0.74	+0.24
B	U OUTPUT	[Waveform]	UP +12	+12
E	U OUTPUT	[Waveform]	DOWN -0.74	+0.24



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM YSTR - ALLOY-DRIVER, Z, 12 VOLTS				4-27-62	115599					729810
DESIGN	RO	3-1-62	SCALE	SMS						
CHECK	WH	3-1-62	DRAWN	LIG	3-17-62					
APPRO			CHECK							

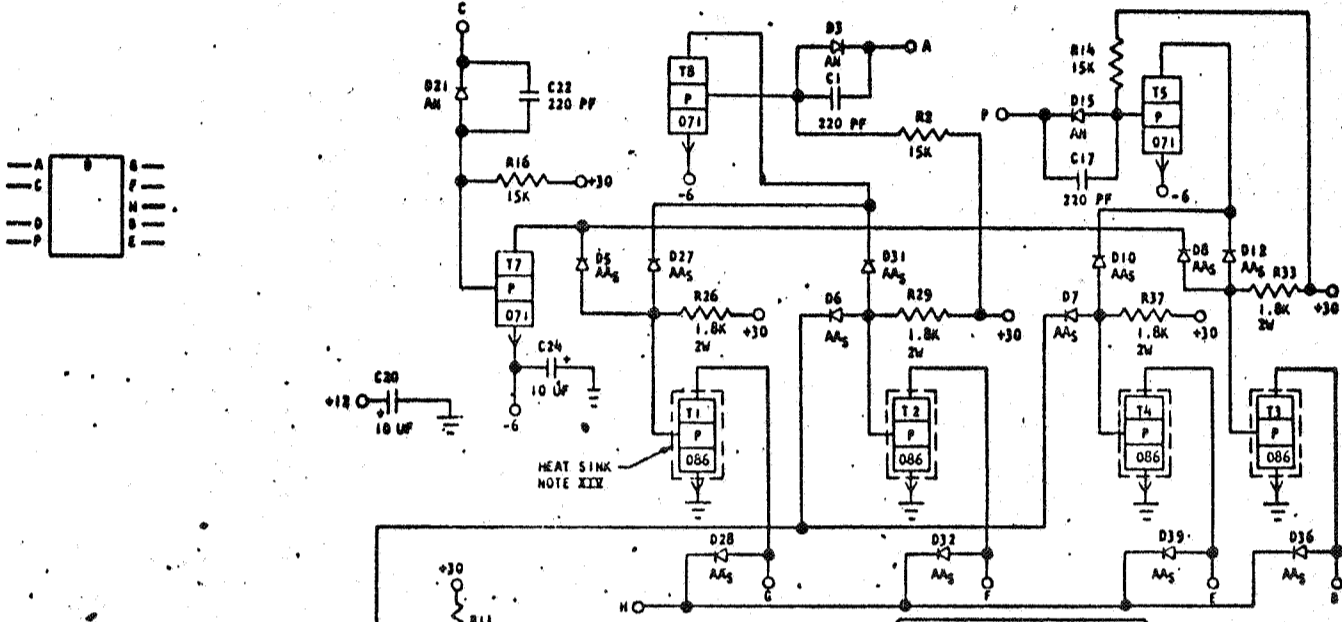
C

729810
STANDARD CODE

729810
A Q V -

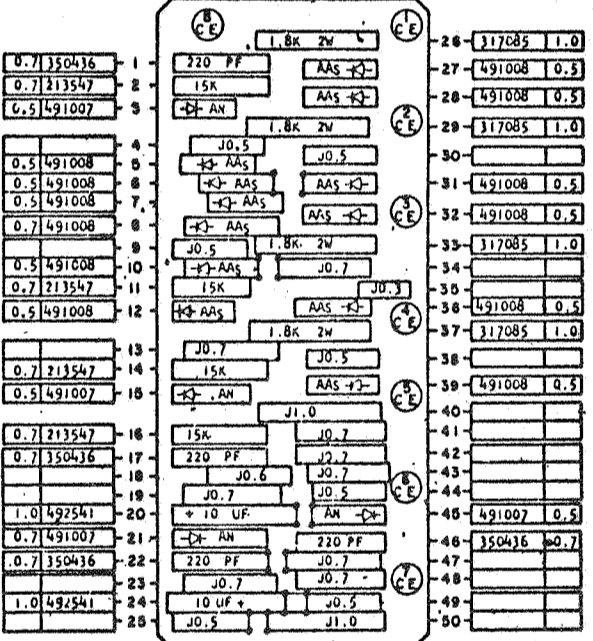
REFERENCE DRAWING
SEE PRODUCTION DRAWING 370834

ALLOY-DRIVER, Z, 12 VOLTS



- SEQUENCE OF OPERATION**
- PIN N TIED TO B (-12)
 - WAVE SHAPE A T8, T5, T6, D6, T1, T2, T3, T4, T7 OFF
 - DOWN INPUT AT A, T8 OFF T1 ON, OUTPUT AT B DOWN
 - T7, T8 OFF, INPUT AT T1, +3, TO 4, VOLTS
 - DELAYS FROM INPUT TO OUTPUT, MEASURED FROM -6 VOLT LEVEL ON INPUT TO +6 VOLT LEVEL ON OUTPUT.
TURN ON 0.9 USEC MAX.
TURN OFF 0.35 USEC MAX.

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
A	U INPUT	[Waveform]	UP -4.66	0.24
			DOWN -7.44	-12.5
P	U INPUT	[Waveform]	UP -4.66	0.24
			DOWN -7.44	-12.5
C	U INPUT	[Waveform]	UP -4.66	0.24
			DOWN -7.44	-12.5
B	U INPUT	[Waveform]	UP -4.66	0.24
			DOWN -7.44	-12.5
G	U OUTPUT	[Waveform]	UP +12	+12
			DOWN -0.74	+0.24
F	U OUTPUT	[Waveform]	UP +12	+12
			DOWN -0.74	+0.24
H	U OUTPUT	[Waveform]	UP +12	+12
			DOWN -0.74	+0.24
E	U OUTPUT	[Waveform]	UP +12	+12
			DOWN -0.74	+0.24



COMPONENT SIDE

CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	DRIVER, Z, 12 VOLTS	DATE	4-2-62	CHANGE NO.	115592	APPROVAL		DATE		DEVELOPMENT NO.
DESIGN	SM	MODEL	SMS	DATE	1-3-61	CHANGE NO.	116034	APPROVAL		DEVELOPMENT NO.
DETAIL	RD	3-1-62	SCALE	NONE						729810
ENGR	WH	3-1-62	DRAW	LLG	3-1-62					
APPRO			CHECK							

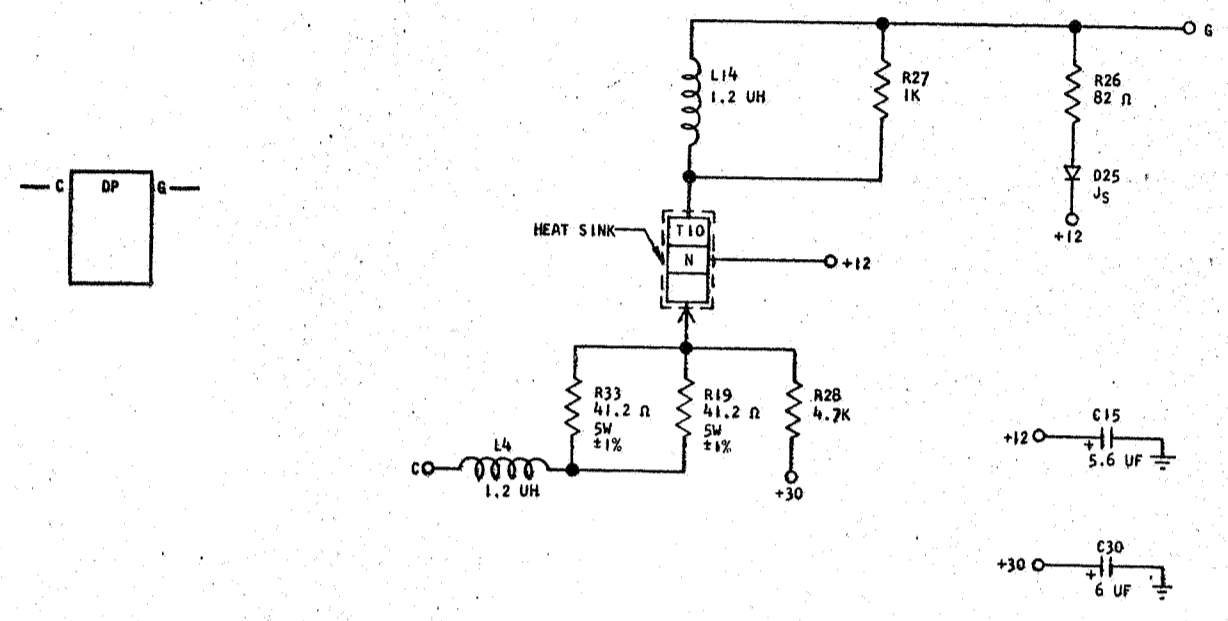
729811
STANDARDS CODE

CARD CODE 729811
A Q W -

REFERENCE DRAWING

SEE PRODUCTION DRAWING 370835

ALLOY-CURRENT SOURCE #2
RECOMMEND MOUNT ON ONE INCH CENTERS NOTE XVIII



SEQUENCE OF OPERATION

1. THIS CIRCUIT PROVIDES A CONSTANT CURRENT SOURCE WHEN POWER IS UP. TRANSISTOR IS ON WHEN POWER IS ON.

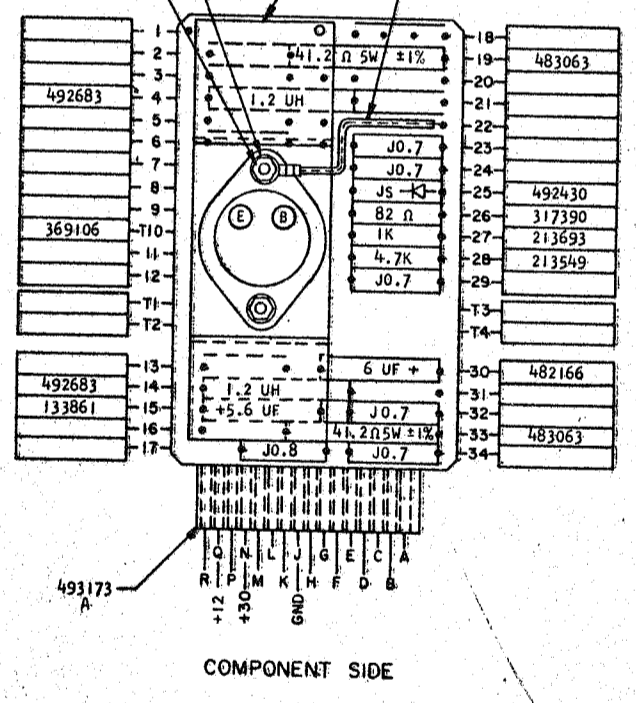
PINS.	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
C		VOLTAGE P-IN	UP +28.8	+31.2
			DOWN	
G	OUTPUT		UP	+11.0
			DOWN	-10.52
				-11.48

109262 BARE WIRE CRIMP TERMINAL
NOTES XI, XII

483076 (2) SCREW
38051 (2) NUT
62031 (2) LOCKWASHER

492680 HEAT SINK

491296 BARE WIRE
512810 TUBING
NOTE XVIII



COMPONENT SIDE

CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR - ALLOY -		7-62	115599					
CURRENT SOURCE #2								
DESIGN	MODEL SMS							
DETAIL RQ	3-1-62 SCALE NONE							
CHECK WH	3-1-62 DRAW LIG 3-17-62							
APPRO	CHECK							

729811

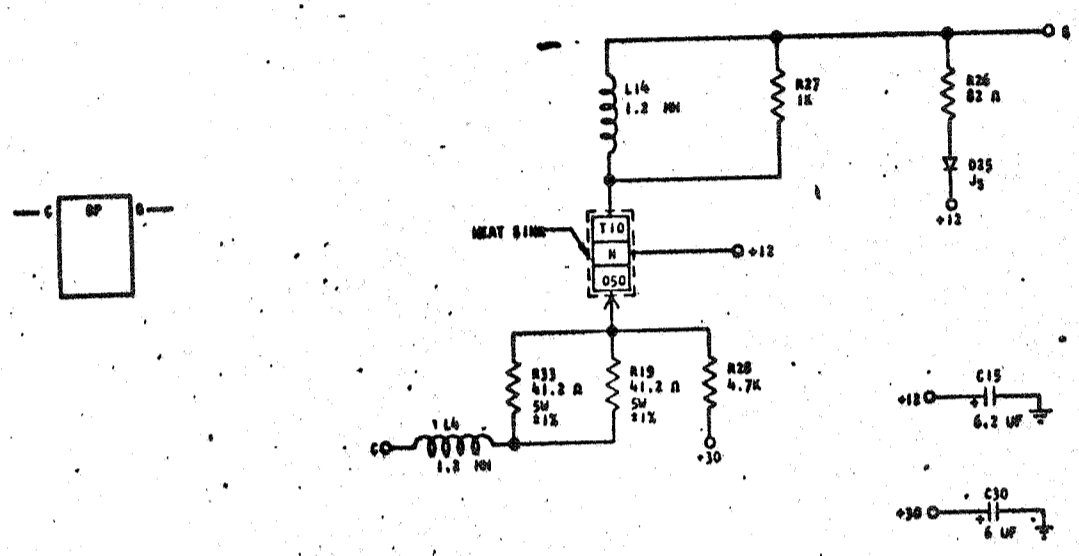
729811
STANDARD CODE

729811
A Q W -

REFERENCE DRAWING

SEE PRODUCTION DRAWING 370835

ALLOY-CURRENT SOURCE #2
RECOMMEND MOUNT ON ONE INCH CENTERS NOTE XXXX



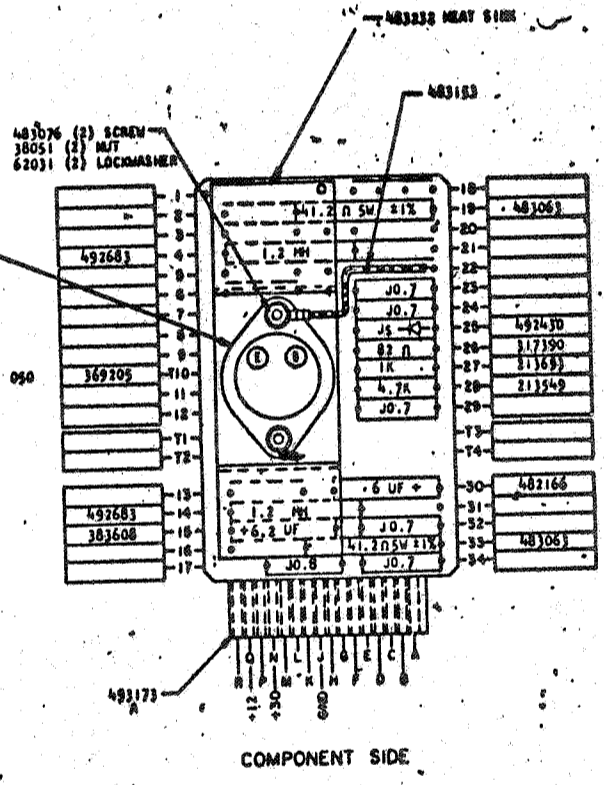
SEQUENCE OF OPERATION

1. THIS CIRCUIT PROVIDES A CONSTANT CURRENT SOURCE WHEN POWER IS UP. TRANSISTOR IS ON WHEN POWER IS ON

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS		
			MIN	MAX	
C	VOLTAGE PIN		UP	+28.0	+31.2
			DOWN		
B	OUTPUT		UP	+11.0	
			DOWN	-10.52	-11.48

489534 CONDUCTIVE ADHESIVE

483076 (2) SCREW
38051 (2) NUT
62031 (2) LOCKWASHER



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
CARD ASM TSTR - ALLOY -				4-27-62	115599					
CURRENT SOURCE #2				1-3-63	116034					
DESIGN	NO	MODEL	SMS							
DETAIL	NO	SCALE	NONE							
CHECK	NO	DRAW	LIG	3-17-62						
APPRO		CHECK								

729811

729812

STANDARDS CODE

CARD CODE

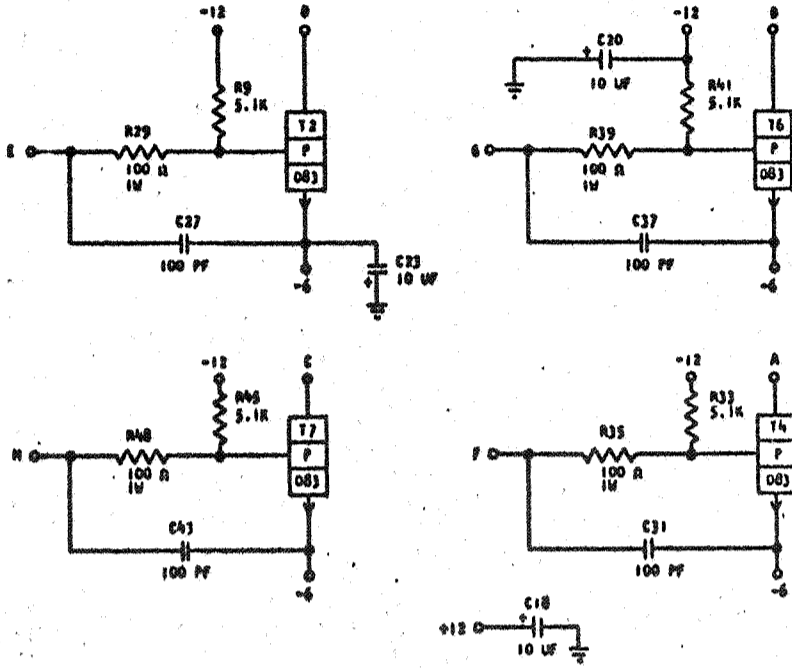
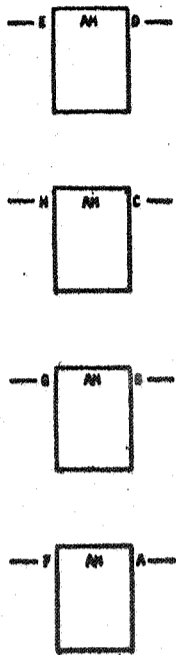
729812

A Q X -

REFERENCE DRAWING

SEE PRODUCTION DRAWING 370836

SENSE - FINAL AMPLIFIER



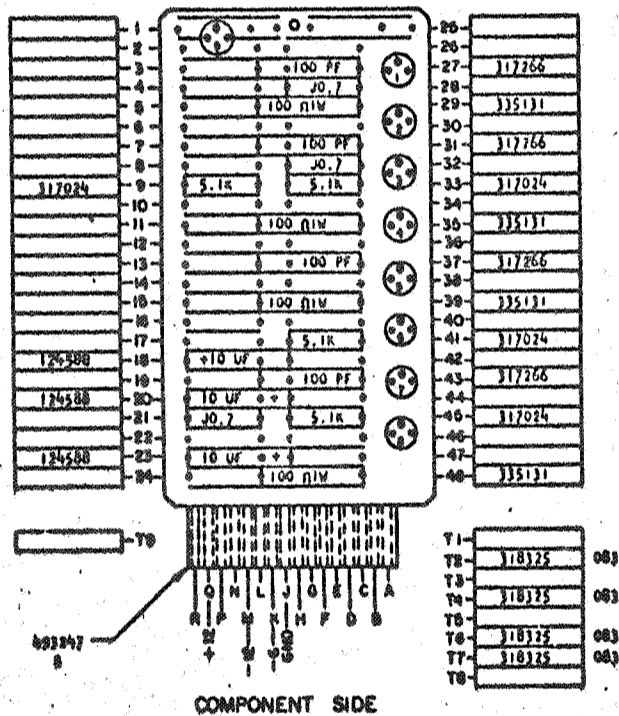
SEQUENCE OF OPERATION

1. INPUT UP, TRANSISTOR ON, OUTPUT DOWN. THIS CIRCUIT PROVIDES A -T LINE FROM A +U LINE INPUT. THE OFF OUTPUT VOLTAGE DEPENDS ON LOAD DRIVEN

2. DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.05	0.18
TURN OFF	0.44	3.00

PINS	SIGNAL NAME	WAVE SHAPPE	LEVELS		
			MIN	MAX	
E, H, G, F	U	INPUT	UP	-5.2	+3.4
			DOWN	-11.52	-12.48
D, C, B, A	-T	OUTPUT	UP	-	-
			DOWN	-5.46	-6.24



COMPONENT SIDE

CIRCUIT AND PACKAGING STANDARD

APPROVAL

DATE

ABC 4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME: CARD ASH TEST - SENSE	4-7-62	115509					
FINAL AMPLIFIER							
DRAWN	RD	3-1-62	SCALE	NONE			
CHECK	WH	3-1-62	DRAW	LIR	3-1-62		
APPROD			CHECK				

729812

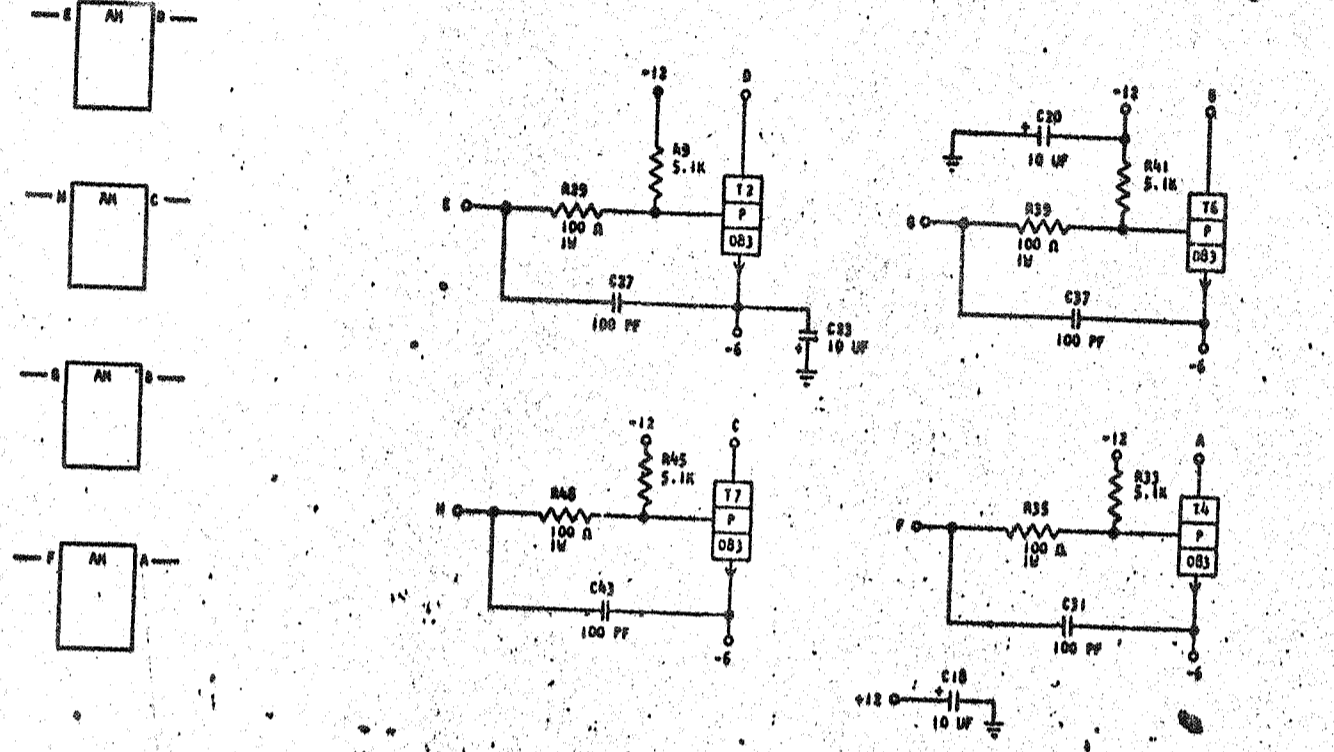
729812
STANDARD
CDBL

729812
A Q X -

REFERENCE DRAWING

SEE PRODUCTION DRAWING 370836

SENSE - FINAL AMPLIFIER

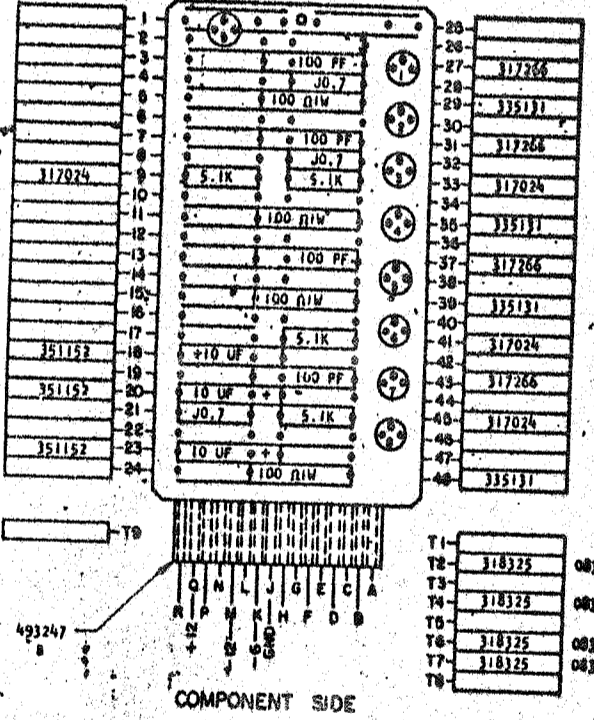


SEQUENCE OF OPERATION

- INPUT UP, TRANSISTOR ON, OUTPUT DOWN. THIS CIRCUIT PROVIDES A -T LINE FROM A +U LINE INPUT. THE OFF OUTPUT VOLTAGE DEPENDS ON LOAD DRIVEN.
- DELAY - USEC

TURN ON	MINIMUM	MAXIMUM
TURN OFF	0.09	0.19
	0.44	2.00

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS		
			MIN	MAX	
U E, H, G, F	INPUT		UP	-5.2	+2.4
T D, C, B, A	OUTPUT		DOWN	-11.65	-12.48
			UP		
			DOWN	-5.46	-6.24



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD ASM TSTR - SENSE	4-29-62	1					
DESIGN	FINAL AMPLIFIER	1-3-63	EC 116034					
DETAIL	RQ 3-7-62	SCALE	NONE	60-4-63	JT B3687			
CHECK	VM 3-1-62	DRAW	AIG B-1243					
APPRO		CHECK						

729812

729813

STANDARD CODE

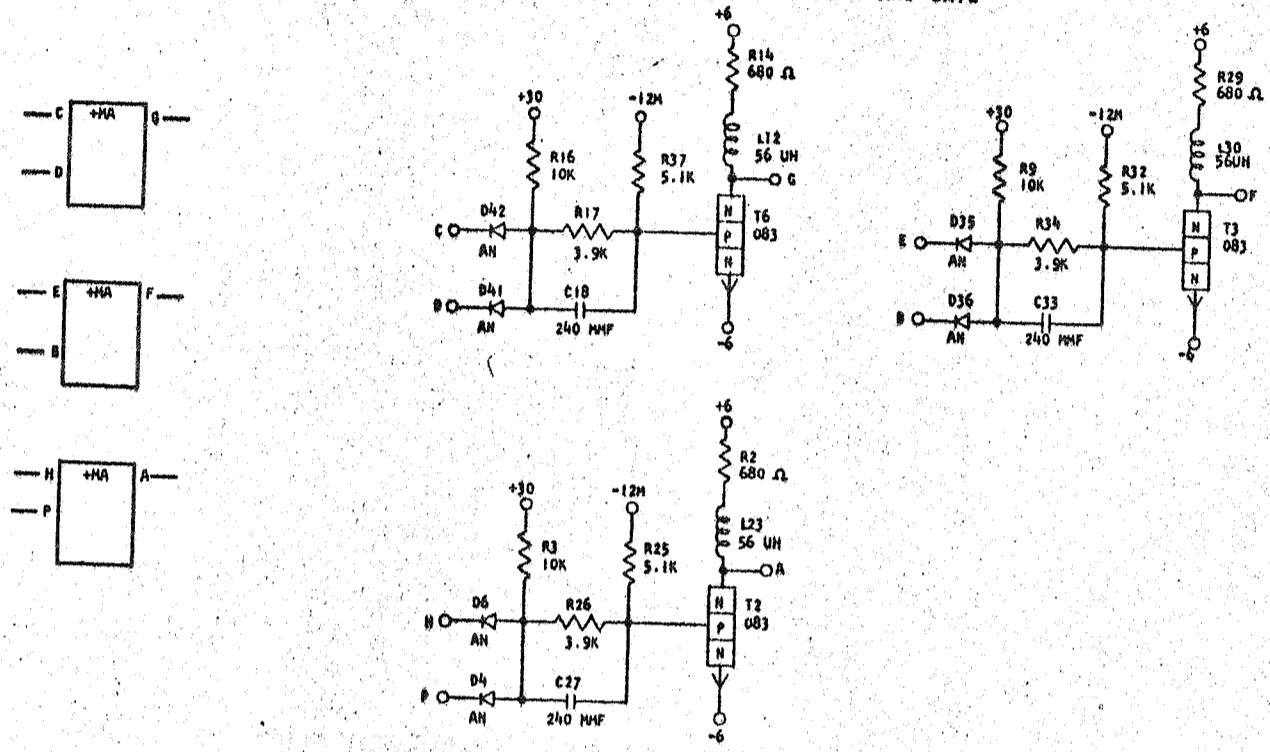
CARD CODE 729813

C A C -

REFERENCE DRAWING

SEE PRODUCTION DRAWING 371922

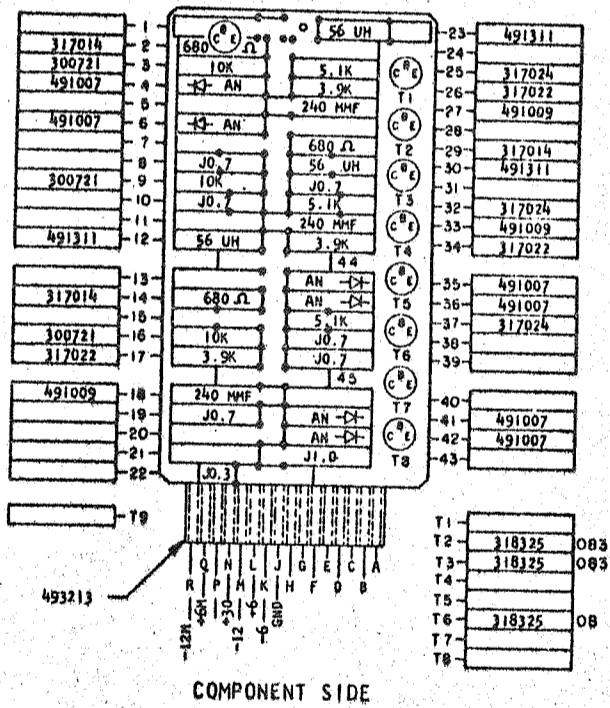
CTDL + AND GATE



SEQUENCE OF OPERATION

1. ALL INPUTS UP TRANSISTOR ON OUTPUT DOWN
2. EITHER OR BOTH INPUTS DOWN TRANSISTOR OFF OUTPUT UP
3. DELAY WHEN DRIVING CTDL LOADS
TURN ON .1 USEC MAX
TURN OFF .25 USEC MAX
4. DELAY WHEN DRIVING CLOCK LOAD
TURN ON .26 USEC MAX
TURN OFF .12 USEC MAX

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS		
			MIN	MAX	
C, D, H, P, E, B	T INPUTS		UP DOWN	+3.68 -4.46	+6.24 -6.24
G, A, F	T OUTPUTS		UP DOWN	+1.44 -4.62	+6.24 -6.24



COMPONENT SIDE

CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62
DEVELOPMENT NO.	
729813	

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR - CTDL + AND GATE				1-7-62	115599					
DESIGN	RG	3-1-62	MODEL	SNS						
DETAIL	RG	3-1-62	SCALE	NONE						
CHECK	MH	3-1-62	DRAW	LIG	3-17-62					
APPROV			CHECK							

729813

729814

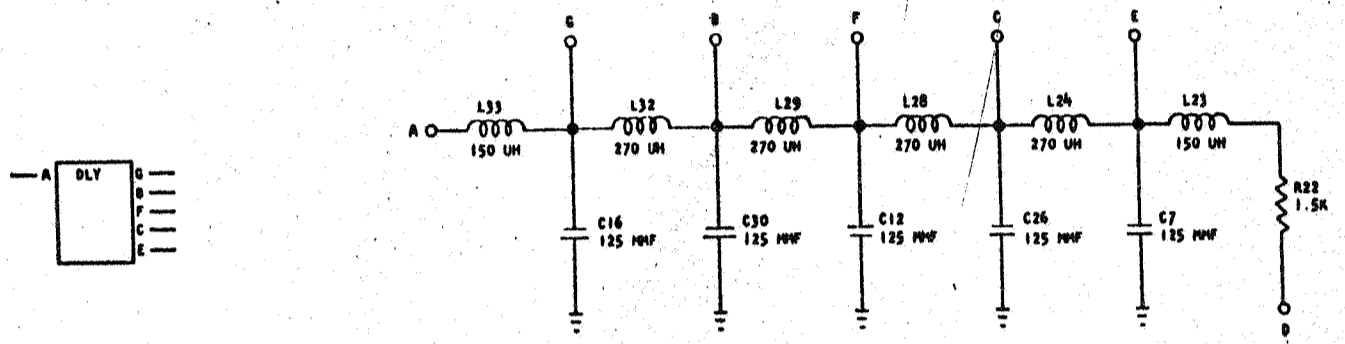
STANDARDS CODE

CARD CODE 729814
C E A

REFERENCE DRAWING

SEE PRODUCTION DRAWING 371944

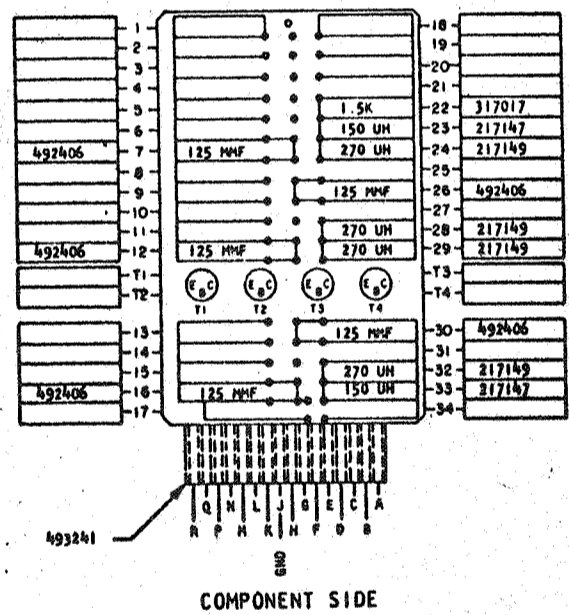
DELAY LINE LUMPED, 1 USEC



SEQUENCE OF OPERATION

1. INPUT UP, OUTPUT UP AFTER DELAY
2. DELAYS: G - 0.2 U SEC
B - 0.4 U SEC
F - 0.6 U SEC
C - 0.8 U SEC
E - 1.0 U SEC
3. TIE 1.5K RESISTOR (PIN D) TO -6 WHEN DRIVING MESA - AND GATE. TIE RESISTOR TO GROUND WHEN DRIVING + AND GATE

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS		
			MIN	MAX	
A	T	INPUT	UP	+3.85	+6.24
			DOWN	-4.46	-6.24
G	T	OUTPUT	UP	+3.45	+5.82
			DOWN	-4.48	-6.24
B	T	OUTPUT	UP	+3.45	+5.82
			DOWN	-4.48	-6.24
F	T	OUTPUT	UP	+3.45	+5.82
			DOWN	-4.48	-6.24
C	T	OUTPUT	UP	+3.45	+5.82
			DOWN	-4.48	-6.24
E	T	OUTPUT	UP	+3.45	+5.82
			DOWN	-4.48	-6.24



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHARGE NO.	APPROVAL	DATE	CHARGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR - DELAY	4-29-62	EC 115599					
LINE LUMPED, 1 USEC	30.4.63	JT 83687					
DESIGN	RQ	3-1-62	SCALE	NONE			
CHECK	WH	3-1-62	DRAW	LTG	3-17-62		
APPRO			CHECK				

4H.

729814

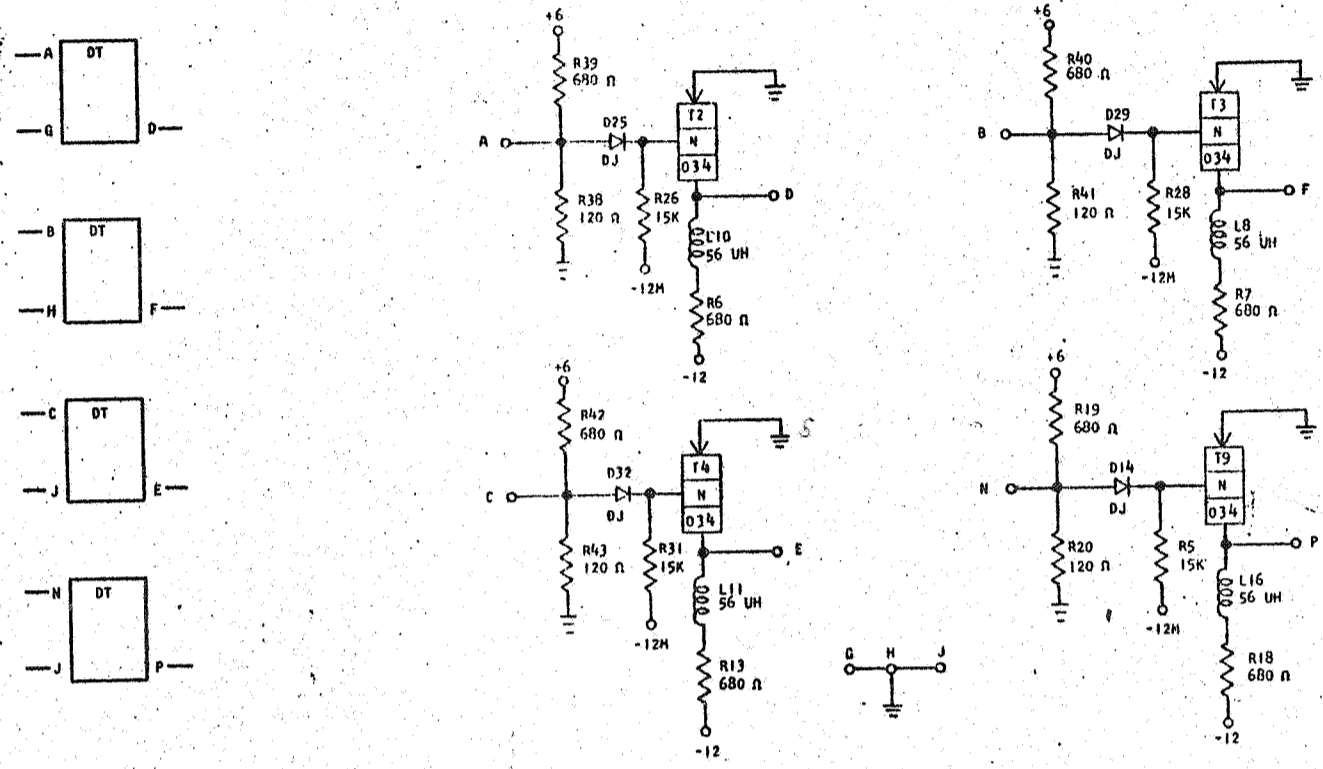
12974

STANDARDS CODE
729815

CARD CODE 729815
CED -

REFERENCE DRAWING
SEE PRODUCTION DRAWING 370145

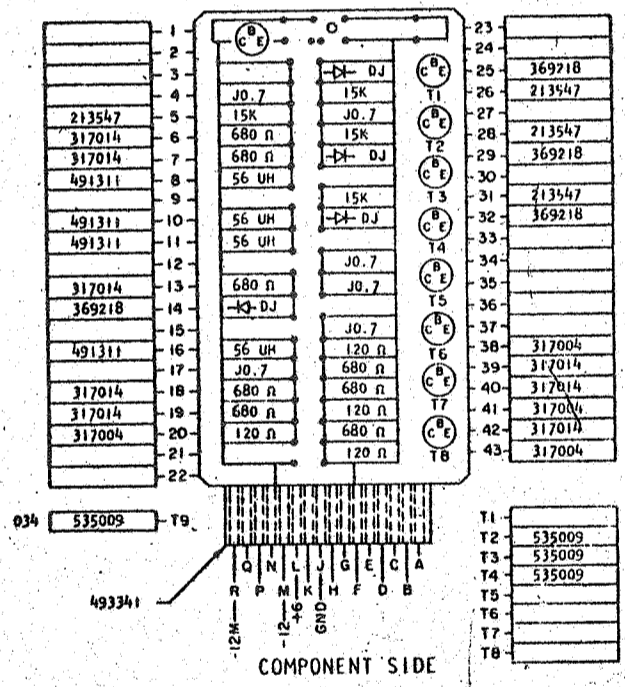
STANDARD CABLE TERMINATOR



- SEQUENCE OF OPERATION
1. INPUT DOWN TRANSISTOR ON OUTPUT UP
 2. INPUT UP TRANSISTOR OFF OUTPUT DOWN

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
A, B, C, N	INPUT		UP	0.65 1.03
G, H, J	GROUND		DOWN	-0.37 -4.46
D, F, E, P	OUTPUT		UP	-0.54 0.24
			DOWN	-7.44 -12.5

DELAY - USEC		
	MINIMUM	MAXIMUM
TURN ON	115.0	220.0
TURN OFF	127.0	312.0



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

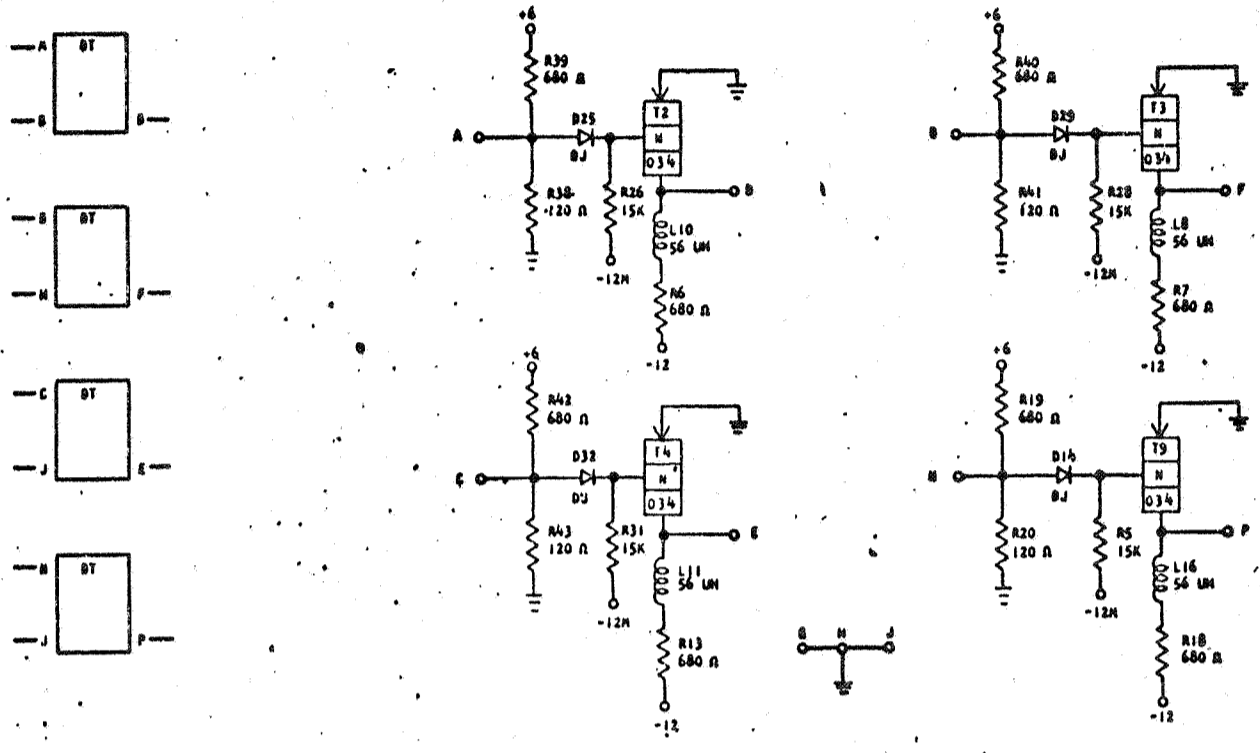
INTERNATIONAL BUSINESS MACHINES CORP.							
NAME	DATE	CHANGE NO.	APPROVAL	DRG	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
CARD ASM TSTR - STANDARD	4-62	115599					729815
CABLE TERMINATOR							
DESIGN	MODEL	SHS					
DETAIL	RQ 3-1-62	SCALE NONE					
CHECK	WH 3-1-62	DRAW LIG 3-17-62					
APPRO	CHECK						

729815
STANDARD BOARD

729815
C E D -

REFERENCE DRAWING
SEE PRODUCTION DRAWING 370145

CTDL SIMPLEX INTERFACE TERMINATOR

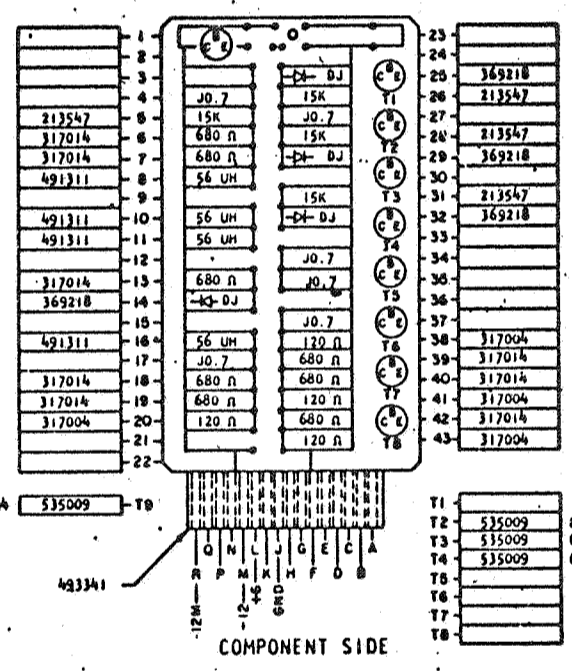


- SEQUENCE OF OPERATION
1. INPUT DOWN TRANSISTOR ON OUTPUT UP
 2. INPUT UP TRANSISTOR OFF OUTPUT DOWN

PINS	SIGNAL NAME	WAVE SHAPES	LEVELS	
			MIN	MAX
A, B, C, H	INPUT		UP	0.65 1.07
G, H, J	GROUND		DOWN	-0.37 -4.46
D, F, E, P	OUTPUT		UP	-0.54 0.24
			DOWN	-7.44 -12.5

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	115.0	220.0
TURN OFF	137.0	312.0



CIRCUIT AND PACKAGING STANDARD

APPROVAL	DATE
ABC	4-2-62

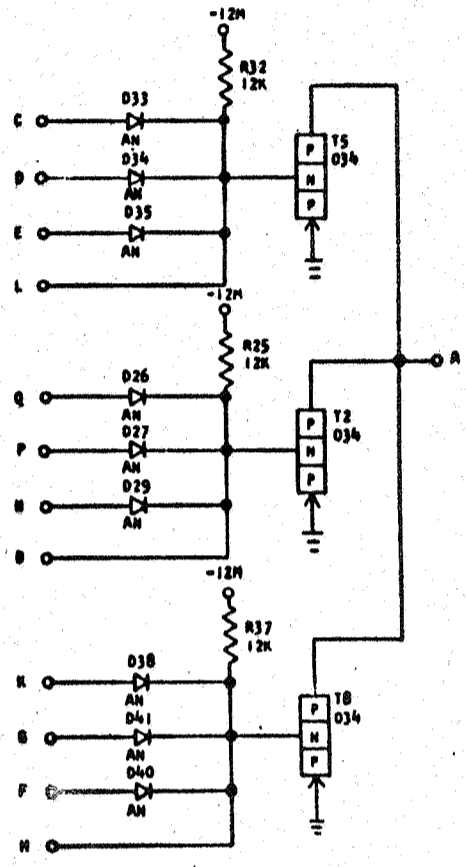
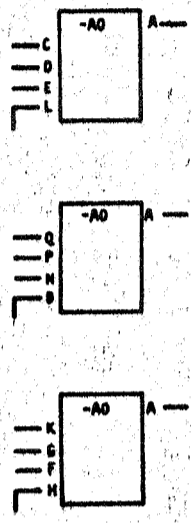
INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR - CTDL	4-29-62	115599					729815
STAPLER INTERFACE TERMINATOR	1-3-63	116034					
DESIGN							
DETAIL							
CHECK							
APPRO							

STANDARDS CODE
729816

CARD CODE 729816
C E E -

REFERENCE DRAWING
SEE PRODUCTION DRAWING 370140

CTDL PNP-3 WAY AND GATE



SEQUENCE OF OPERATION

1. ALL INPUTS DOWN TRANSISTOR ON OUTPUT UP
2. ANY INPUT UP TRANSISTOR OFF OUTPUT DOWN
3. COLLECTOR LOADING REQUIRED
4. INPUTS ON EXTENDER CARD MUST BE DOWN IN COINCIDENCE WITH INPUTS ON CARD FOR UP OUTPUT
5. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN

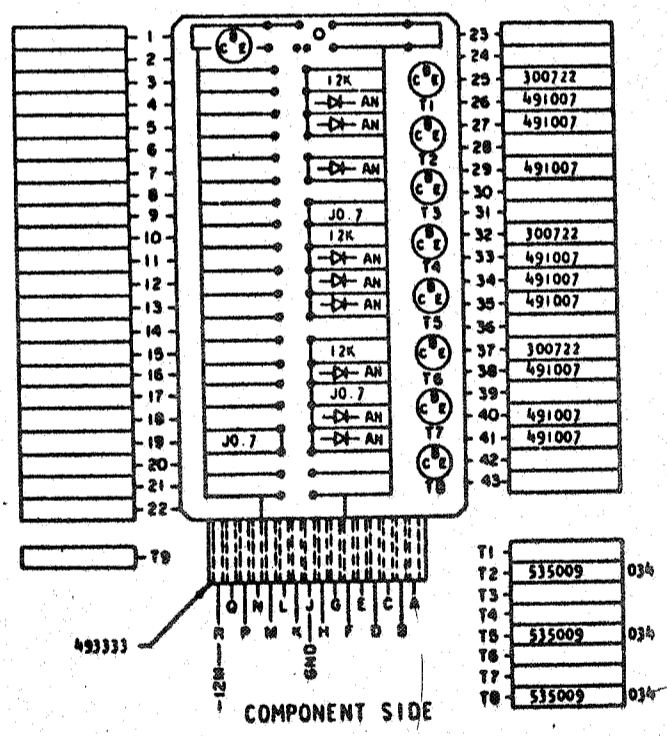
PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
C, D, E	T INPUT	[Waveform: High to Low]	UP	1.44 6.24
			DOWN	-0.74 -6.24
Q, P, N	T INPUT	[Waveform: High to Low]	UP	1.44 6.24
			DOWN	-0.74 -6.24
K, G, F	T INPUT	[Waveform: High to Low]	UP	1.44 6.24
			DOWN	-0.74 -6.24
L, O, H	EXTENDER INPUT	[Waveform: High to Low]	UP	1.44 6.24
			DOWN	0 0
A	U OUTPUT	[Waveform: Low to High]	UP	-0.54 0.24
			DOWN	-7.44 -12.5

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.10	0.80
TURN OFF	0.05	0.80*

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.

NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS. EXAMPLE: LOGIC BLOCK DRIVING FF 'OR'.



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD ASM TSTR -CTDL PNP 3	DATE	4-2-62	CHANGE NO.	EC115599	APPROVAL		DATE		DEVELOPMENT NO.
DESIGN	WAY AND GATE	DATE	30-4-63	CHANGE NO.	JT 83687	APPROVAL		DATE		DEVELOPMENT NO.
DETAIL	RQ 3-1-62	SCALE	NONE							
CHECK	VM 3-1-62	DRAW	LIG 3-17-62							
APPRO		CHECK								

729816

729817

STANDARDS CODE

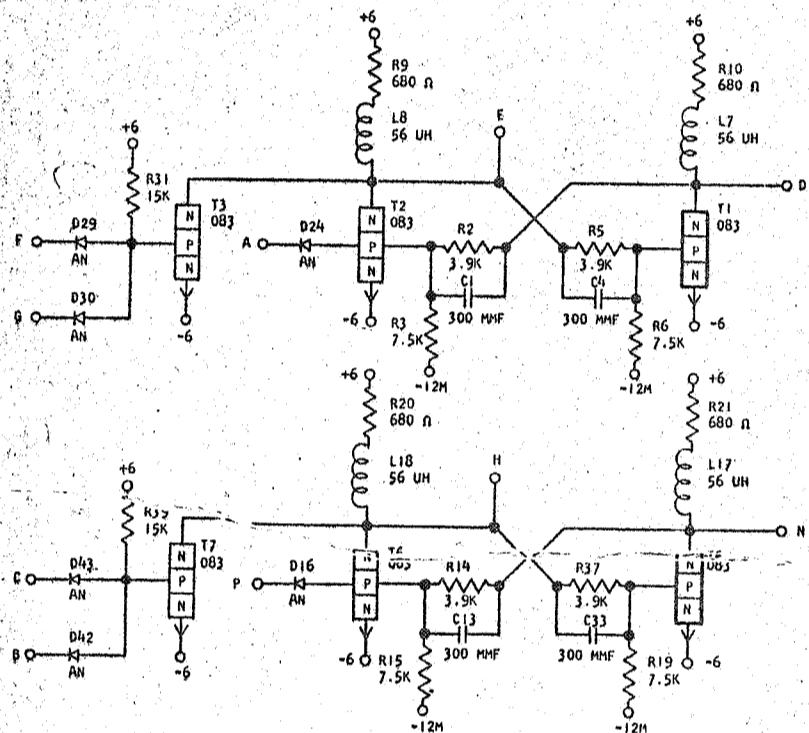
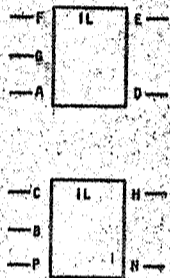
CARD CODE 729817

CEH-

REFERENCE DRAWING

SEE PRODUCTION DRAWING 370139

CTDL INVERTER LATCH NPN



SEQUENCE OF OPERATION

1. T1 ON, T2, T3 OFF
2. UP LEVEL AT F & G TURNS T3 ON, T1 OFF, T2 ON BY COLLECTIVE PULLOVER
3. DOWN LEVEL AT A WILL RETURN CIRCUIT TO CONDITION (1)

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
F, G, C, B	U SET	[Waveform]	UP	-5.26 +2.4
A, P	U RESET	[Waveform]	DOWN	-7.44 -12.48
E, H	T ON OUTPUT	[Waveform]	UP	1.44 6.24
D, N	T OFF OUTPUT	[Waveform]	DOWN	-5.46 -6.24

DELAY - SET

1. CONSIDER PIN D OR N AS OUTPUT
TURN OFF 1.26 USEC MAXIMUM
TURN ON 1.50 USEC
2. CONSIDER PIN E OR H AS OUTPUT
TURN OFF 1.66 USEC MAXIMUM
TURN ON .86 USEC MAXIMUM

RESET

1. PIN D OR N AS OUTPUT
TURN OFF 0.45
TURN ON 0.45
2. PIN E OR H AS OUTPUT
TURN OFF 0.40
TURN ON 0

491226	1	300 MHF	O	23	
317022	2	3.9K	K1 AN	24	491007
300720	3	7.5K	JO.7	25	
491226	4	300 MHF		26	
317022	5	3.9K	JO.7	27	
300720	6	7.5K	JO.7	28	
491311	7	56 UH	K1 AN	29	491007
491311	8	56 UH	K1 AN	30	491007
317014	9	680 Ω	15K	31	213547
317014	10	680 Ω	JO.7	32	
	11			33	491226
491226	12	300 MHF	JO.7	34	
317022	13	3.9K	JO.7	35	
300720	14	7.5K	3.9K	36	317022
491007	15	K1 AN	JO.7	37	
491311	16	56 UH	15K	38	
491311	17	56 UH	JO.7	39	213547
300720	18	7.5K	JO.7	40	
317014	19	680 Ω	JO.7	41	
317014	20	680 Ω	K1 AN	42	491007
317014	21	680 Ω	K1 AN	43	491007
	22				

T1	318325	083
T2	318325	083
T3	318325	083
T4		
T5	318325	083
T6	318325	083
T7	318325	083
T8		

COMPONENT SIDE

CIRCUIT AND PACKAGING STANDARD

APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD	ASH	TSTR - CTDL	6-7-62	115599					729817
DESIGN	RQ	3-1-62	SCALE	NONE						
CHECK	VH	3-1-62	DRAW	LIG	3-17-62					
APPRO			CHECK							

729817

729818

STANDARDS CODE

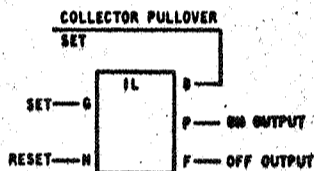
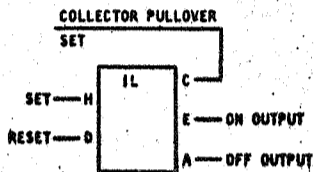
CARD CODE 729818

CEK -

REFERENCE DRAWING

SEE PRODUCTION DRAWING 370143

CTDL PNP - INVERTER LATCH



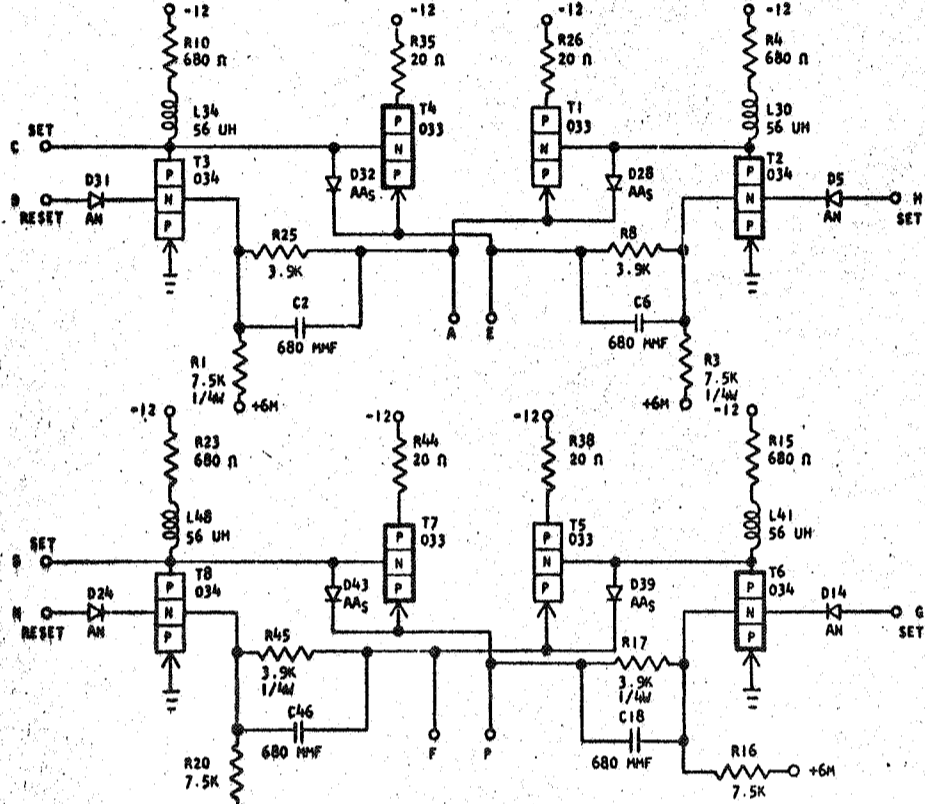
SEQUENCE OF OPERATION

1. T2 & T4 ON T1 & T3 OFF
2. 0V SET AT H OR C TURNS T2 OFF AND T1 ON T3 TURNS ON AND T4 TURNS OFF
3. 6V RESET AT D RETURNS CIRCUIT TO CONDITION (1)

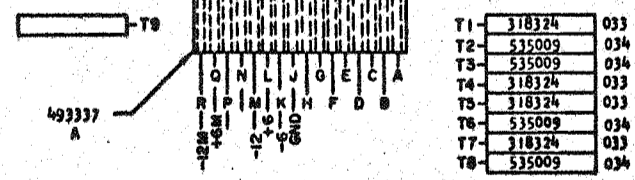
PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
G,H	T SET	[Waveform]	UP 1.44	6.24
D,H	T RESET	[Waveform]	UP 1.44	6.24
E,P	U ON OUTPUT	[Waveform]	UP -1.24	.24
A,F	U OFF OUTPUT	[Waveform]	DOWN -9.29	-12.48
B,C	U COLLECTOR PULLOVER SET	[Waveform]	UP -1.24	.24
			DOWN -7.44	-12.48

DELAY

1. SET AND RESET DELAY:
TURN ON .15 USEC FOR SET TO OUTPUT AT OFFSIDE (PIN A, F)
AND FOR RESET TO OUTPUT OF ONSIDE (PIN E, P).
2. TURN ON .40 USEC FOR SET TO OUTPUT AT ONSIDE (PIN E, P)
AND FOR RESET TO OUTPUT OF OFFSIDE (PIN A, F).



216465	1	7.5K 1/4W	3.9K	25	317022
350449	2	680 MMF	20 Ω	26	334949
216465	3	7.5K 1/4W	JO.7	27	
37014	4	680 n	←-AAs	28	491008
491007	5	←-AN	JO.7	29	
350449	6	680 MMF	56 UH	30	491311
317022	7	JO.7	←-AN	31	491007
317014	8	3.9K	←-AAs	32	491008
	9	JO.7	JO.7	33	
	10	680 n	56 UH	34	491311
	11	JO.7	20 n	35	334949
	12	JO.7	JO.7	36	
	13	JO.7	JO.7	37	
491007	14	←-AN	20 n	38	334949
317014	15	680 n	←-AAs	39	491008
300720	16	7.5K	JO.7	40	
216458	17	3.9K 1/4W	56 UH	41	491311
350449	18	680 MMF	JO.7	42	491008
300720	19	JO.7	←-AAs	43	491008
	20	7.5K	20 n	44	334949
	21	JO.7	3.9K 1/4W	45	216458
	22	680 n	680 MMF	46	350449
317014	23	680 n	JO.7	47	
491007	24	←-AN	56 UH	48	491311



COMPONENT SIDE

CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASH TSTR-CTDL-PNP				6-29-62	EC	115599				729818
INVERTER LATCH				10-4-63	JT	83687				
DESIGN	RD	3-1-62	MODEL	SMS						
DETAIL	WH	3-1-62	SCALE	NONE						
CHECK	LN	3-1-62	DRAW	LIG	3-17-62					
APPRO			CHECK							

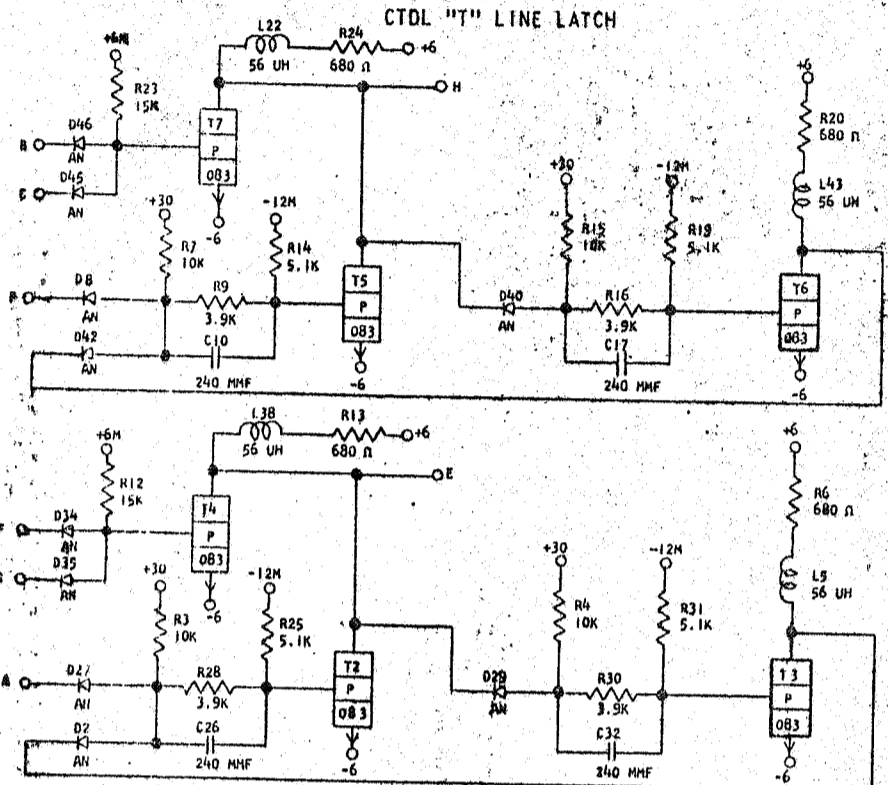
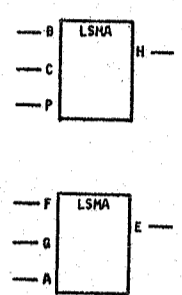
C

729819

STANDARDS CODE

CARD CODE 729819
CEM -

REFERENCE DRAWING
SEE PRODUCTION DRAWING 370357



SEQUENCE OF OPERATION

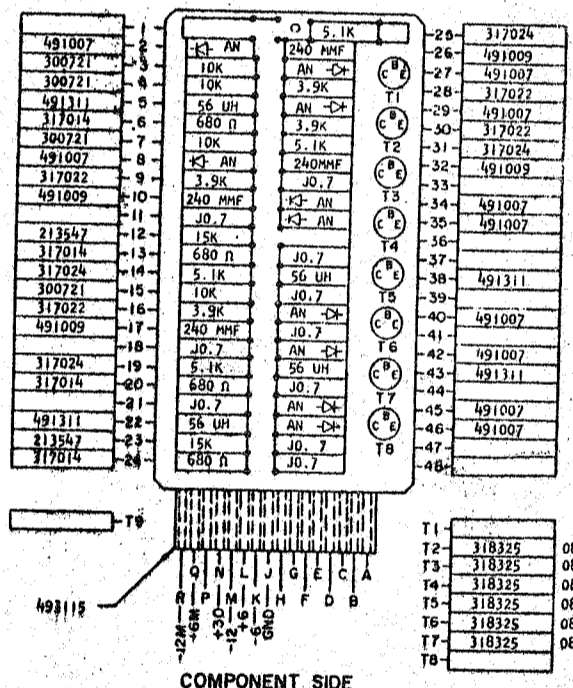
- T6 IS ON, T5, T7 OFF
- WHEN B & C ARE UP; T7 TURNS ON, THE OUTPUT IS DOWN, T6 TURNS OFF, T5 TURNS ON
- WHEN P IS DOWN, T5 IS OFF, THE OUTPUT IS UP, T6 TURNS ON

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
B, C	U SET	[Waveform]	UP	-5.26 6.24
H	T OUTPUT	[Waveform]	DOWN	-7.44 -12.48
P	T RESET	[Waveform]	UP	1.44 6.24
F, G	U SET	[Waveform]	DOWN	-5.46 -6.24
E	T OUTPUT	[Waveform]	DOWN	-4.46 -6.24
A	T RESET	[Waveform]	UP	3.68 6.24
			DOWN	-4.46 -6.24

DELAY - USEC

1. SET TO OUTPUT			
TURN ON	MIN.	MAX.	
TURN OFF	0.05	0.70	
	0.05	1.50	

2. RESET TO OUTPUT:			
TURN ON	----	.08	
TURN OFF	----	.23	



COMPONENT SIDE

CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.							
NAME	BOARD ASM TSTR-LIDL	DATE	52	CHANGE NO.	115599	APPROVAL	
MODEL	5MS						
SCALE	3-1-62						
SCALE	3-1-62						
SCALE	3-1-62						
SCALE	3-1-62						

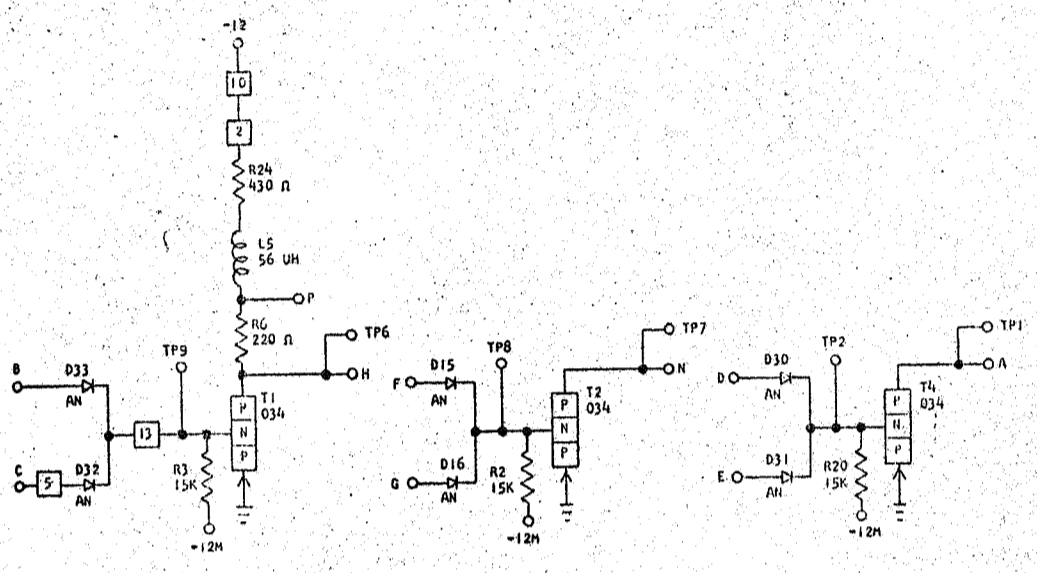
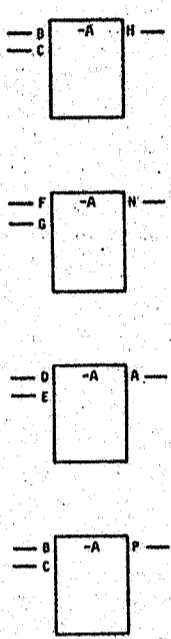
729819

STANDARDS CODE
729821

CARD CODE 729821
CG VV

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371262

CTDL - TWO WAY "AND" PNP ONE LOAD



- SEQUENCE OF OPERATION
1. BOTH INPUTS DOWN TRANSISTOR ON OUTPUT UP
 2. ANY INPUT UP TRANSISTOR OFF OUTPUT DOWN
 3. T2, T4, COLLECTORS MUST BE LOADED
 4. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN

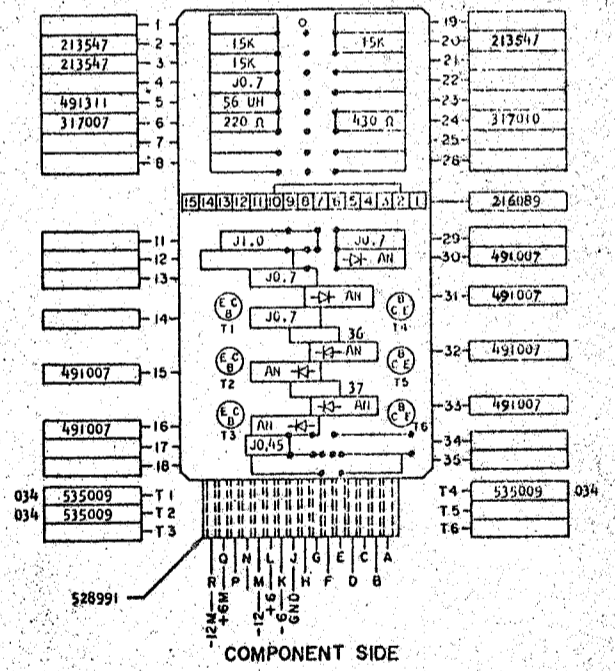
PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
B, F, D	T INPUT	[Square Wave]	UP	1.44 - 6.24
			DOWN	-0.74 - -6.24
C, G, E	T INPUT	[Square Wave]	UP	1.44 - 6.24
			DOWN	0.74 - -6.24
H, N, A	U OUTPUT	[Square Wave]	UP	0.54 - 0.24
			DOWN	-7.44 - -12.5
P	P OUTPUT	[Square Wave]	UP	-4.93 - -3.54
			DOWN	-8.82 - -12.5

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.10	0.80
TURN OFF	0.05	0.80

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.

NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS. EXAMPLE: LOGIC BLOCK DRIVING OF "OR".



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR -CTDL - TWO WAY "AND" PNP ONE LOAD	62	115599					729821
DESIGN							
DETAIL							
CHECK							
APPROV							

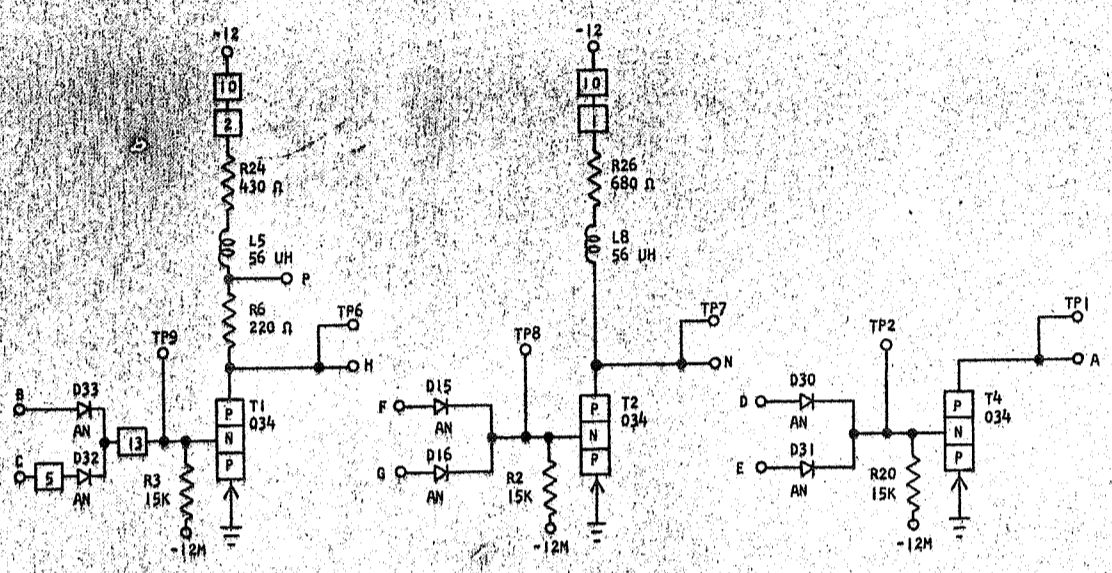
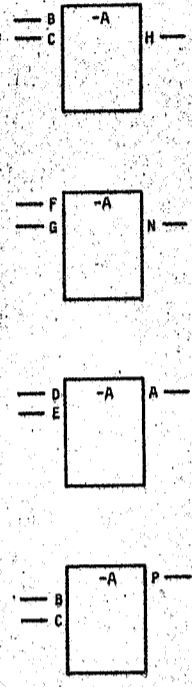
729821

729822
STANDARDS CODE

CARD CODE 729822
CG VW

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371261

CTDL - TWO WAY "AND" PNP TWO LOADS



SEQUENCE OF OPERATION

1. BOTH INPUTS DOWN TRANSISTOR ON OUTPUT UP
2. ANY INPUT UP TRANSISTOR OFF OUTPUT DOWN
3. T4 COLLECTOR MUST BE LOADED
4. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN

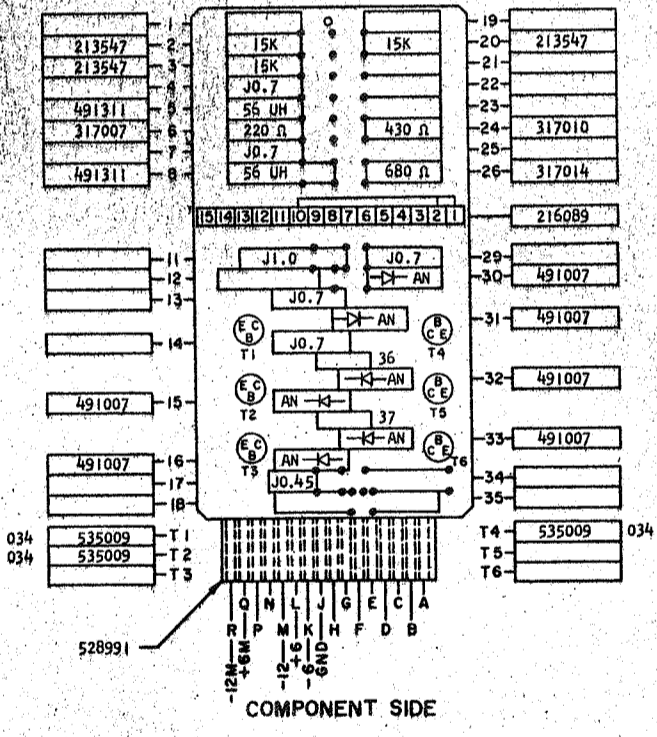
PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
B, F, D	T	INPUT	UP	1.44 - 6.24
			DOWN	-0.74 - -6.24
G, G, E	T	INPUT	UP	1.44 - 6.24
			DOWN	-0.74 - -6.24
H, N, A	U	OUTPUT	UP	-0.54 - 0.24
			DOWN	-7.44 - -12.5
P	P	OUTPUT	UP	-4.93 - -3.54
			DOWN	-8.82 - -12.5

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.10	0.80
TURN OFF	0.05	0.80*

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.

NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS. EXAMPLE: LOGIC BLOCK DRIVING EF "OR".



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD ASM TSTR-CTDL-TWO WAY "AND" PNP TWO LOADS	62	115599					
DESIGN								
DETAIL	RQ 3-1-62	SCALE	NONE					
CHECK	WH 3-1-62	DRAW	LIG 3-17-62					
APPRO		CHECK						

729822

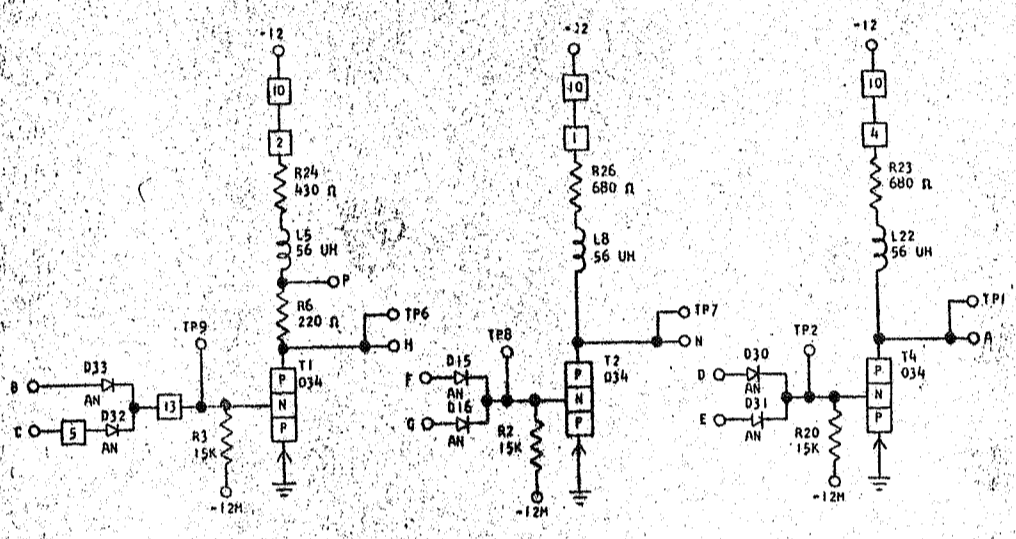
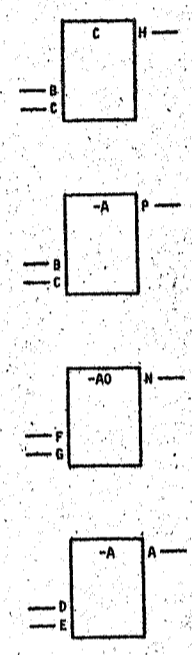
729823

STANDARD CODE

CARD CODE 729823
CG WW

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371251

CTDL - TWO WAY "AND" PNP



SEQUENCE OF OPERATION

1. BOTH INPUTS DOWN, TRANSISTOR ON, OUTPUT UP
2. ANY INPUT UP TRANSISTOR OFF OUTPUT DOWN
3. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN

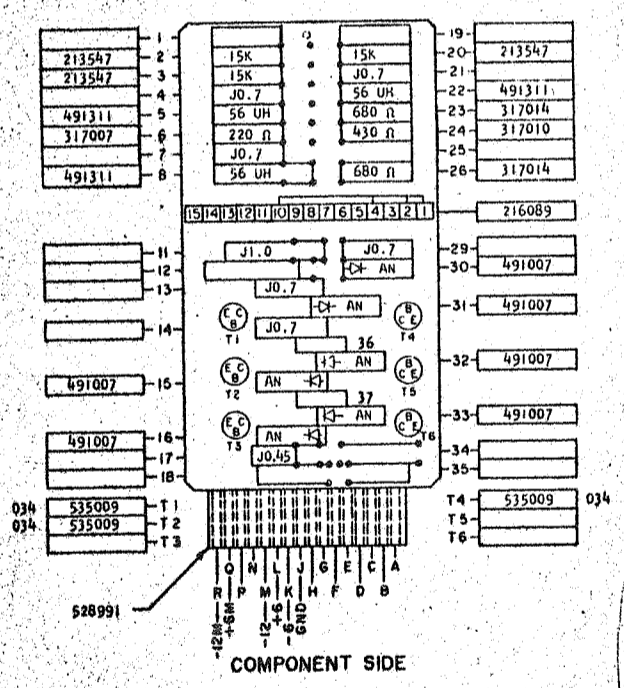
PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
B, F, D	T	INPUT	UP	1.44 - 6.2
			DOWN	-0.7 - -6.2
C, G, E	T	INPUT	UP	1.44 - 6.2
			DOWN	-0.7 - -6.2
H, N, A	U	OUTPUT	UP	-0.5 - 0.2
			DOWN	-7.4 - -12.5
P	P	OUTPUT	UP	-4.93 - -3.54
			DOWN	-8.82 - -12.5

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.10	0.80
TURN OFF	0.05	0.80

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.

NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS. EXAMPLE: LOGIC BLOCK DRIVING EP 'ON'.



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD ASM	TSTR-CTRL - TWO	WAY "AND" PNP	62	115599					
DESIGN	RQ	3-1-62	SCALE	NONE						
DETAIL	WH	3-1-62	DRAW	L16	3-1-62					
CHECK										
APPRO										

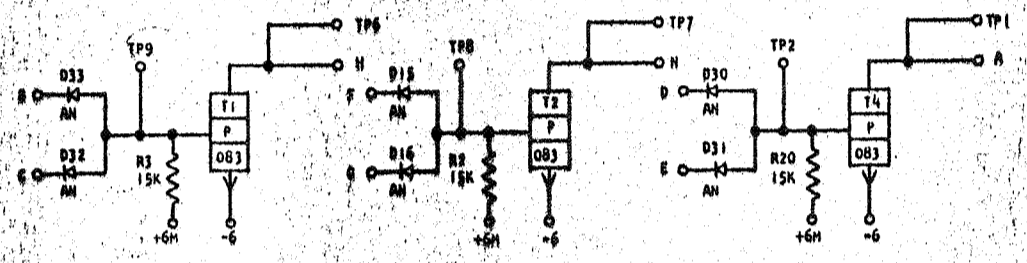
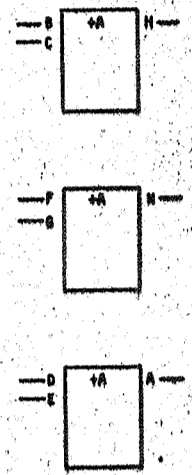
729823

STANDARD CODE
729824

CARD CODE 729824
CH --

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371266

CTDL - TWO WAY "AND" NPN NO LOADS



SEQUENCE OF OPERATION

1. BOTH INPUTS UP, TRANSISTOR ON, OUTPUT DOWN
2. ANY INPUT DOWN, TRANSISTOR OFF, OUTPUT UP
3. COLLECTORS MUST BE LOADED
4. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN.

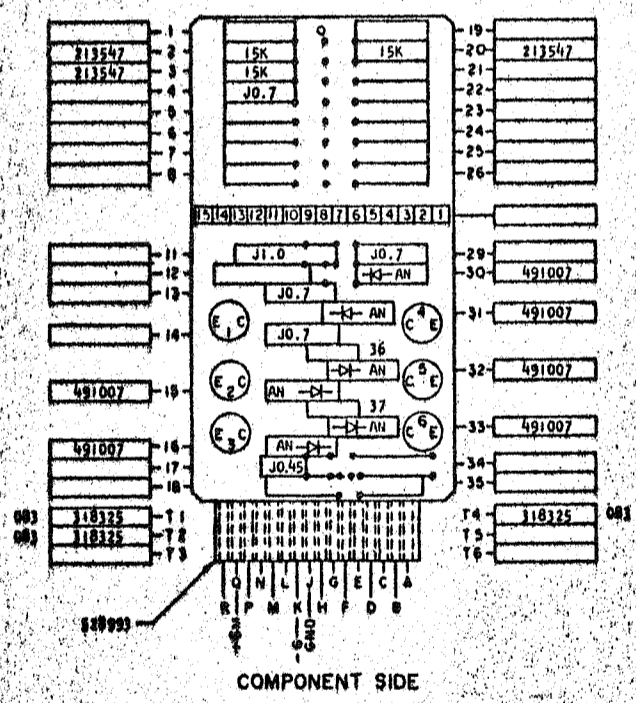
PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
B, F, D	U INPUT	[Waveform: High then Low]	UP	-5.26 0.24
			DOWN	-7.44 -12.5
C, G, E	U INPUT	[Waveform: High then Low]	UP	-5.26 0.24
			DOWN	-7.44 -12.5
H, A, A	T OUTPUT	[Waveform: Low then High]	UP	1.44 6.24
			DOWN	-5.46 -6.24

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.05	0.70
TURN OFF	0.05	1.50*

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.

NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS. EXAMPLE: LOGIC BLOCK DRIVING OF "OR".



CIRCUIT AND PACKAGING STANDARD

APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR - CTDL-TWO				4-2-62	115899					729824
WAY "AND" NPN NO LOADS										
DESIGN	NO	MODEL	SPS							
DETAIL NO	3-1-62	SCALE	NONE							
CHECK NO	3-1-62	DRAW	LIG D-17-62							
APPROV		CHECK								

729824

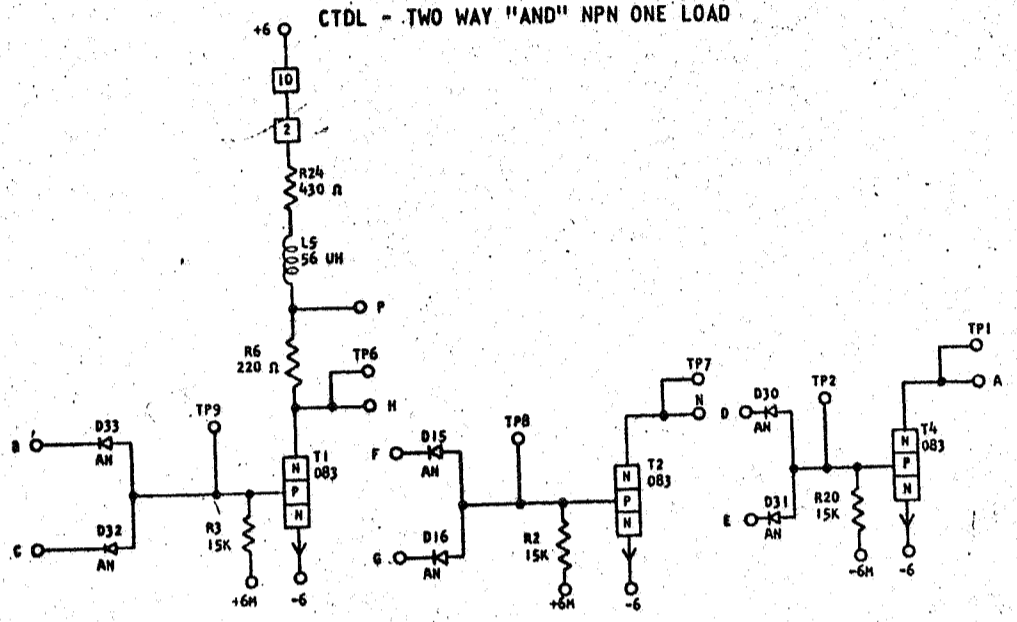
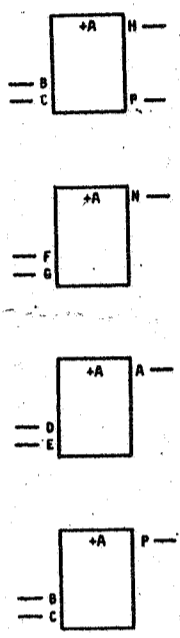
729825

STANDARDS CODE

CARD CODE 729825
CH VV

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371265

CTDL - TWO WAY "AND" NPN ONE LOAD



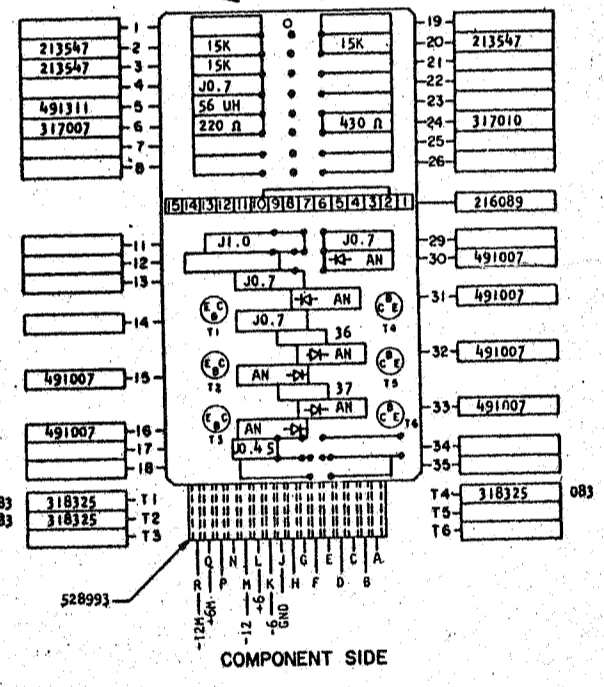
- SEQUENCE OF OPERATION
- BOTH INPUTS UP, TRANSISTOR ON, OUTPUT DOWN
 - ANY INPUT DOWN, TRANSISTOR OFF, OUTPUT UP
 - T2, T4 COLLECTORS MUST BE LOADED
 - LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
B, F, D	U INPUT	[Square wave]	UP	-5.26 0.24
C, G, E	U INPUT	[Square wave]	DOWN	-7.44 -12.5
H, N, A	T OUTPUT	[Square wave]	UP	1.44 6.24
P	N OUTPUT	[Square wave]	DOWN	-5.46 -6.24
			UP	2.82 6.24
			DOWN	-1.07 -2.40

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.05	0.70
TURN OFF	0.05	1.50*

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.
NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS. EXAMPLE: LOGIC BLOCK DRIVING EF "OR".



CIRCUIT AND PACKAGING STANDARD

APPROVAL	DATE
ABC	4-2-62

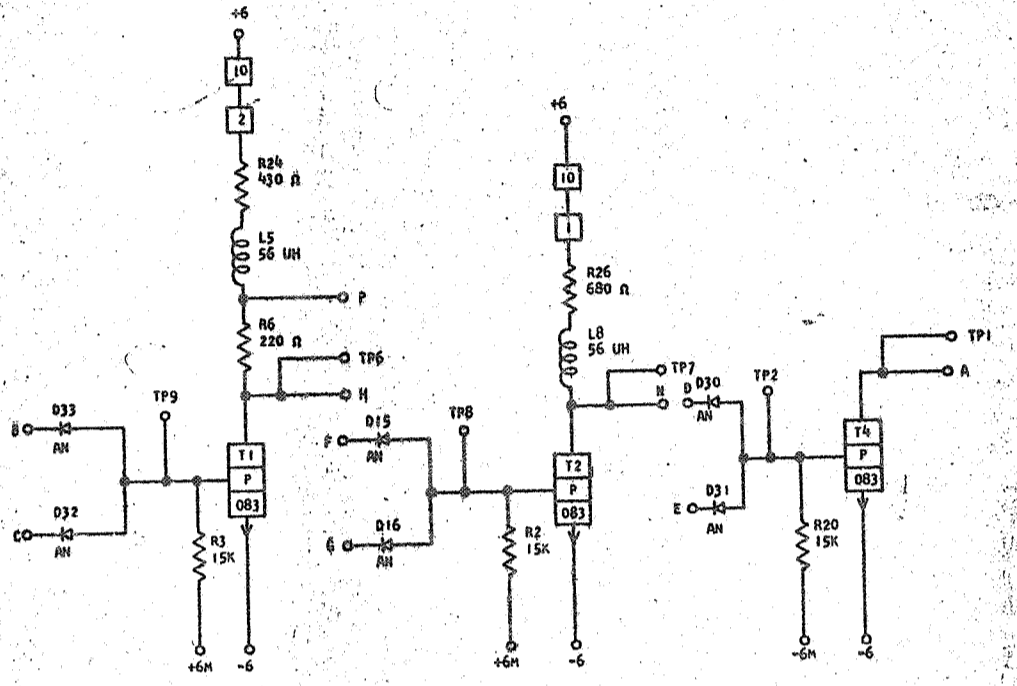
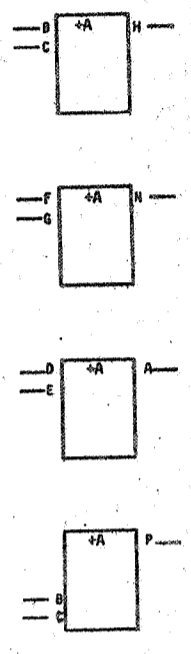
INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR CTDL - TWO WAY "AND" NPN ONE LOAD	4-2-62	115599					729825
DESIGN							
DETAIL							
CHECK							
APPROV							

STANDARDS CODE
729826

CARD CODE 729826
CH VW

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371264

CTDL-TWO WAY "AND" NPN TWO LOADS



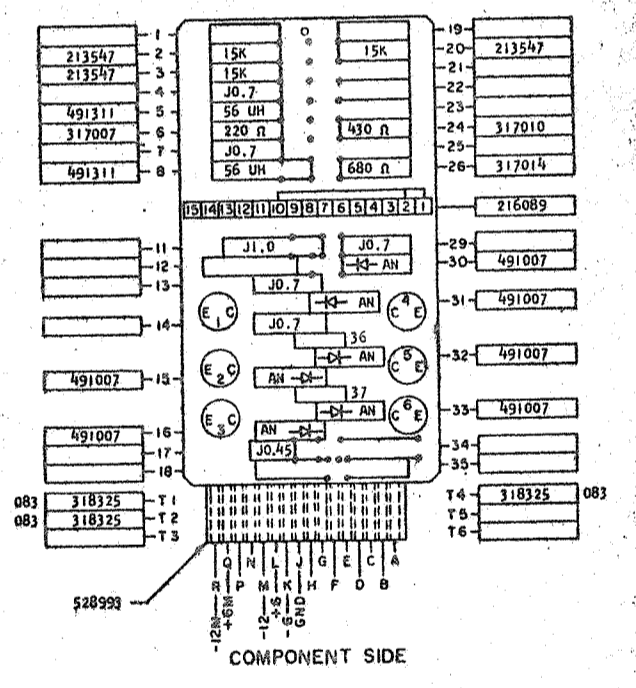
- SEQUENCE OF OPERATION
1. BOTH INPUTS UP, TRANSISTOR ON, OUTPUT DOWN
 2. ANY INPUT DOWN TRANSISTOR OFF OUTPUT UP
 3. T4 COLLECTOR MUST BE LOADED
 4. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
B, F, D	U	INPUT	UP	-5.26 0.24
			DOWN	-7.44 -12.5
C, G, E	U	INPUT	UP	-5.26 0.24
			DOWN	-7.44 -12.5
H, N, A	T	OUTPUT	UP	1.44 6.24
			DOWN	-5.46 -6.24
P	N	OUTPUT	UP	2.82 6.24
			DOWN	-1.07 -2.40

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.05	0.70
TURN OFF	0.05	1.50*

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.
NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS. EXAMPLE: LOGIC BLOCK DRIVING EF "OR".



CIRCUIT AND PACKAGING STANDARD

APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR CTDL-TWO WAY "AND" NPN TWO LOADS	7-62	115599					
DESIGN							
DETAIL	3-1-62	SCALE	NONE				
CHECK	3-1-62	DRAW	LTC	3-17-62			
APPRO		CHECK					

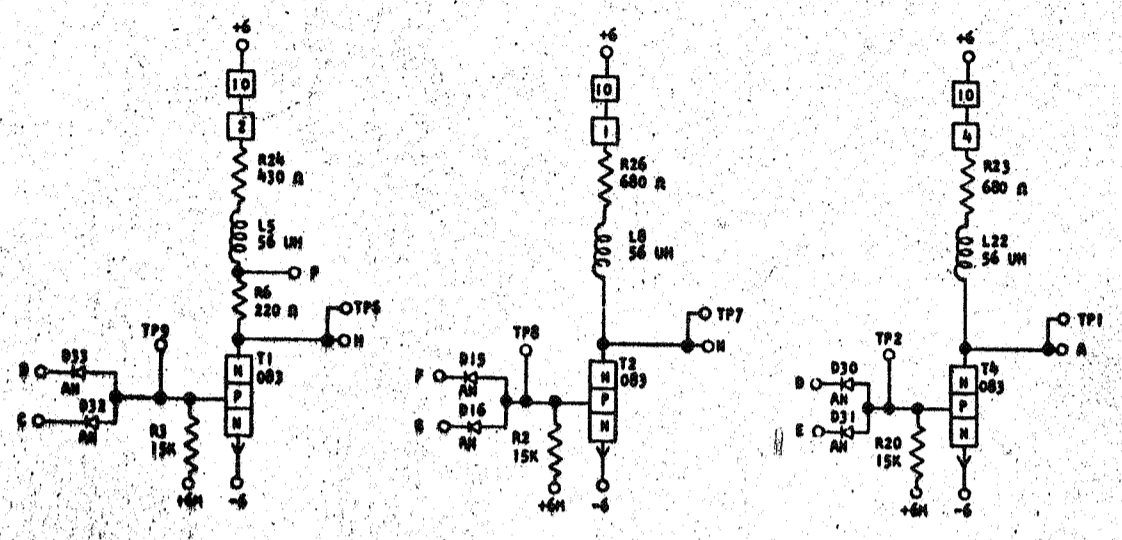
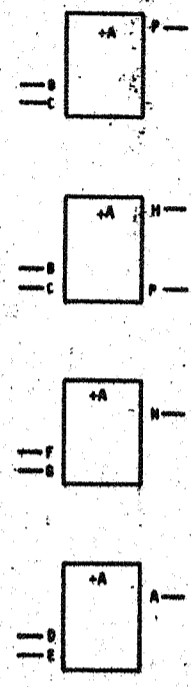
729827

STANDARD CODE

CARD CODE 729827
CH. WW

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371252

CTDL - TWO WAY "AND" NPN



SEQUENCE OF OPERATION

1. BOTH INPUTS UP, TRANSISTOR ON, OUTPUT DOWN
2. ANY INPUT DOWN TRANSISTOR OFF OUTPUT UP
3. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN

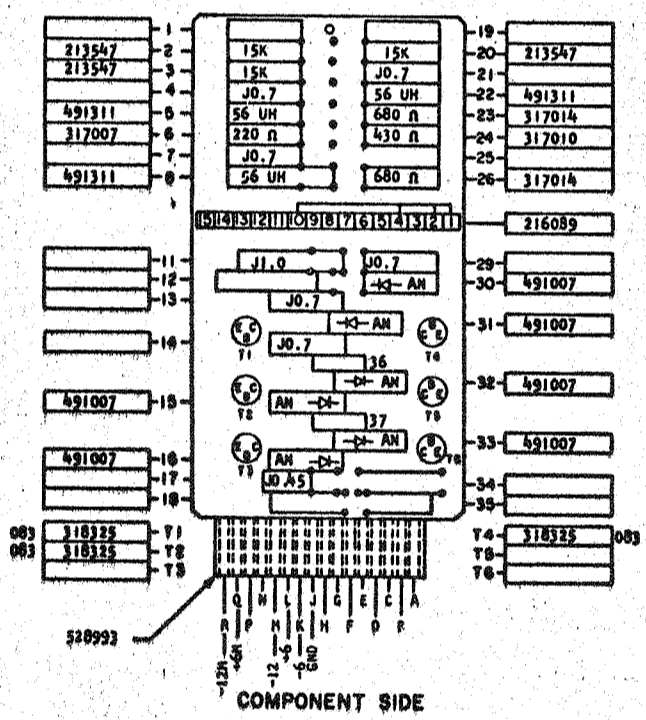
PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
B, F, D	U	INPUT	UP	-5.3 0.2
			DOWN	-7.4 -12.5
C, G, E	U	INPUT	UP	-5.3 0.2
			DOWN	-7.4 -12.5
H, N, A	T	OUTPUT	UP	1.4 6.24
			DOWN	-5.5 -6.24
P	N	OUTPUT	UP	2.62 6.24
			DOWN	-1.07 -2.40

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.05	0.70
TURN OFF	0.05	1.50

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.

NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS. EXAMPLE: LOGIC BLOCK DRIVING EF 'ON'.



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHARGE NO.	APPROVAL	DATE	CHARGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD ASM TSTR - CTDL - TWO	DATE	4-29-62	EC	115599					729827
	WAY "AND" NPN	DATE	30.4.62	JT	89687					
DESIGN	RD	SCALE	3-1-62	MODEL	NONE					
CHECK	WH	DRAWN	3-1-62	LIST	3-17-62					
APPRO		CHECK								

729827

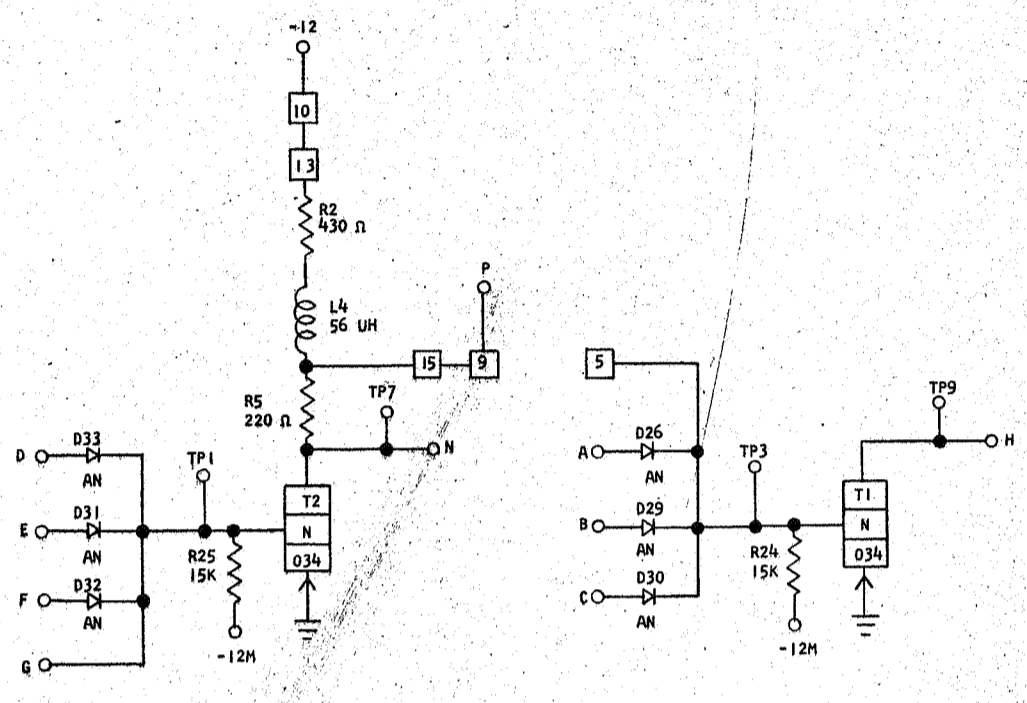
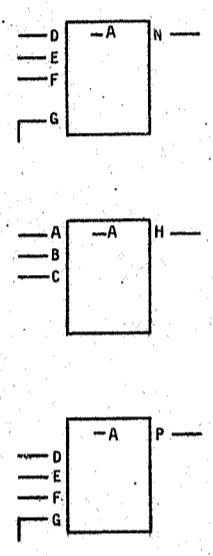
729828

STANDARDS CODE

CARD CODE 729828
CJ VU

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371267

CTDL 3 WAY "AND" PNP ONE LOAD



SEQUENCE OF OPERATION

1. ALL INPUTS DOWN TRANSISTOR ON OUTPUT UP
2. ANY INPUT UP TRANSISTOR OFF OUTPUT DOWN
3. INPUTS ON EXTENDER CARD DOWN IN COINCIDENCE WITH DOWN INPUTS ON CARD FOR UP OUTPUT
4. T1 COLLECTOR MUST BE LOADED
5. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN

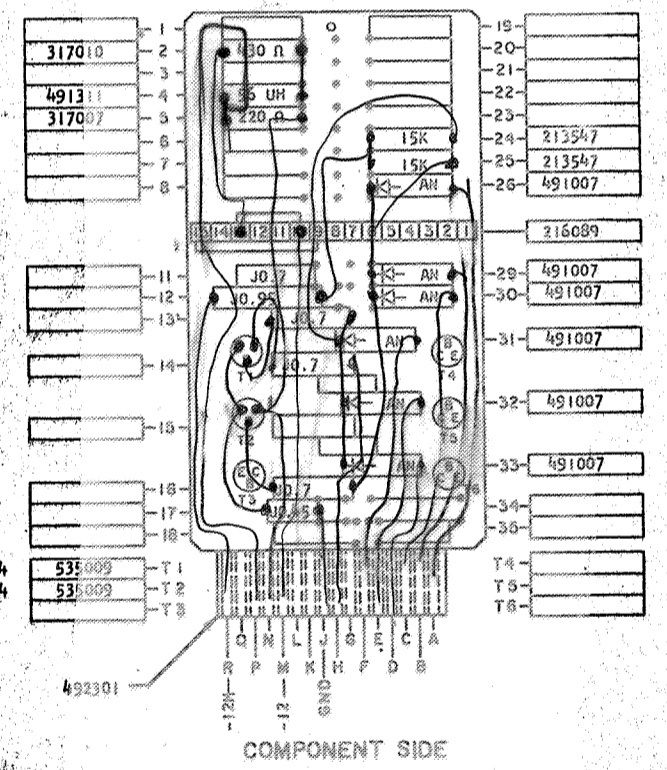
PINS	SIGNAL NAME	WAVE SHAPE	LEVELS		
			MIN	MAX	
D, A	T	INPUT	UP	1.44	6.24
			DOWN	-0.74	-6.24
E, B	T	INPUT	UP	1.44	6.24
			DOWN	-0.74	-6.24
F, C	T	INPUT	UP	1.44	6.24
			DOWN	-0.74	-6.24
G	EXTENDER INPUT	INPUT	UP	+6.0	
			DOWN	0.0	
H, N	U	OUTPUT	UP	-0.54	0.24
			DOWN	-7.44	-12.5
P	P	OUTPUT	UP	-4.93	-3.54
			DOWN	-8.82	-12.5

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.10	0.80
TURN OFF	0.05	0.80*

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCK.

NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS.
EXAMPLE: LOGIC BLOCK DRIVING EF "OR".



COMPONENT SIDE

CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.	
NAME	CARD ASM ISTR - CTDL - 3	DATE	4-2-62	CHANGE NO.	115599	APPROVAL		DATE		DEVELOPMENT NO.	
DESIGN		MODEL	SMS								
DETAIL	RQ 3-1-62	SCALE	NONE								
CHECK	WH 3-1-62	DRAW	LIG 3-17-62								
APPRO		CHECK									

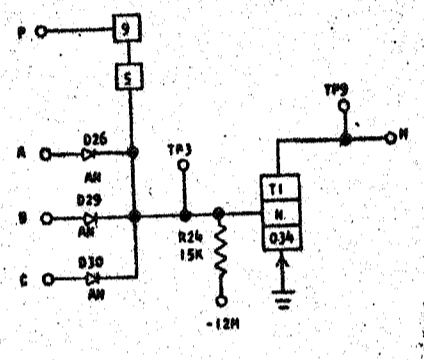
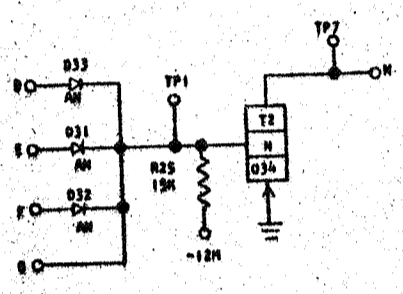
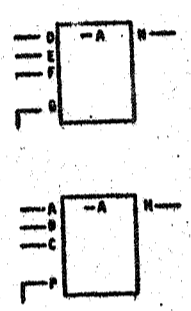
729828

729829
STANDARD CODE

CARD CODE 729829
CJ WF

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371268

CTDL 3-WAY "AND" PNP NO LOADS



- SEQUENCE OF OPERATION
1. ALL INPUTS DOWN TRANSISTOR ON OUTPUT UP
 2. ANY INPUT UP TRANSISTOR OFF OUTPUT DOWN
 3. INPUTS ON EXTENDER CARD DOWN IN COINCIDENCE WITH DOWN INPUTS ON CARD FOR UP OUTPUT
 4. COLLECTORS MUST BE LOADED
 5. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN

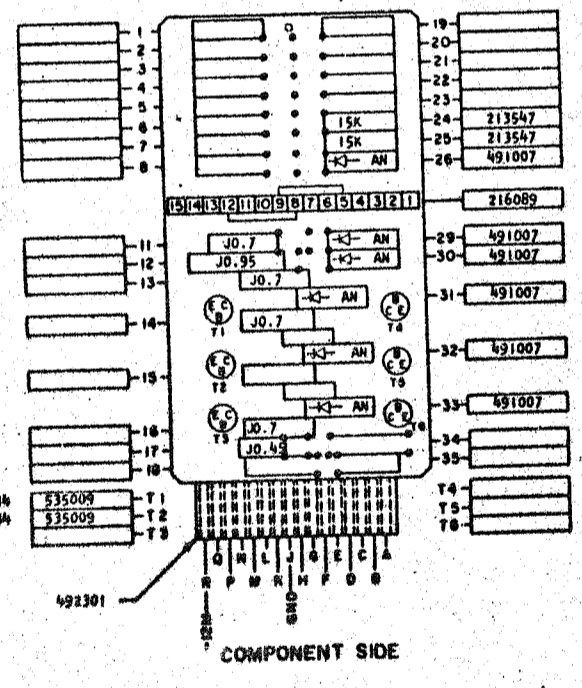
PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
D, A T	INPUT		UP	1.44 6.24
			DOWN	-0.74 -6.24
E, B T	INPUT		UP	1.44 6.24
			DOWN	-0.74 -6.24
F, C T	INPUT		UP	1.44 6.24
			DOWN	-0.74 -6.24
G, P	EXTENDER INPUT		UP	+6.0
			DOWN	0.0
H, H U	OUTPUT		UP	-0.54 0.24
			DOWN	-7.44 -12.5

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.10	0.80
TURN OFF	0.05	0.80

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.

NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS. EXAMPLE: LOGIC BLOCK DRIVING EP "00".



CIRCUIT ADD. PACKAGING STANDARD

APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASH YSTR-CTDL - 3	6-29-62	EC 115599					729829
WAY "AND" PNP NO LOADS	30-4-63	JT 83687					
DESIGN	MODEL	SMS					
DETAIL RD	3-1-62	SCALE NONE					
CHECK WR	3-1-62	DRAW LIG 3-17-62					
APPRO	CHECK						

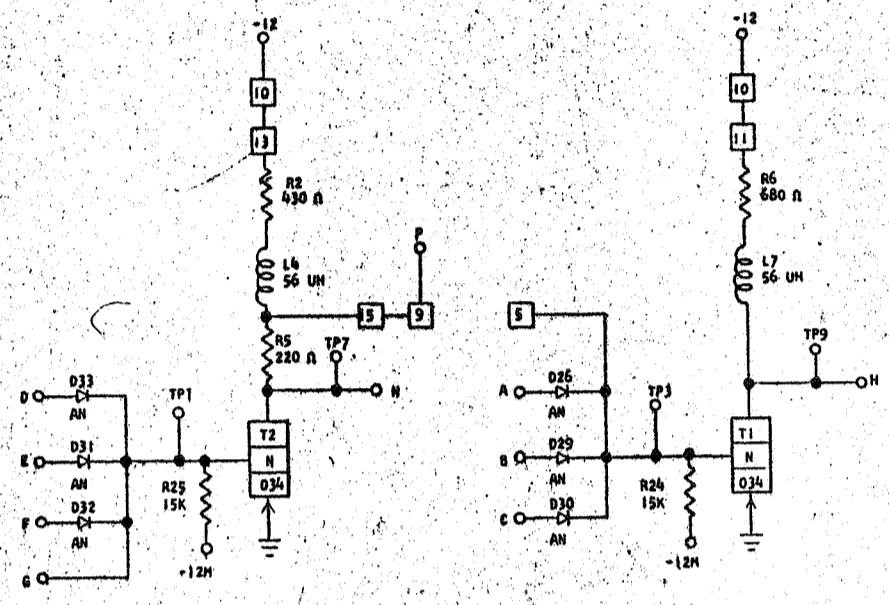
729829

STANDARD CODE
729830

CARD CODE
CJ WV
729830

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371253

CTDL 3-WAY "AND" PNP



SEQUENCE OF OPERATION

1. ALL INPUTS DOWN, TRANSISTOR ON, OUTPUT UP
2. ANY INPUT UP, TRANSISTOR OFF, OUTPUT DOWN
3. THE INPUTS ON THE EXTENDER CARD MUST BE DOWN IN COINCIDENCE WITH INPUTS ON CARD FOR AN UP OUTPUT
4. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN BQ/MH

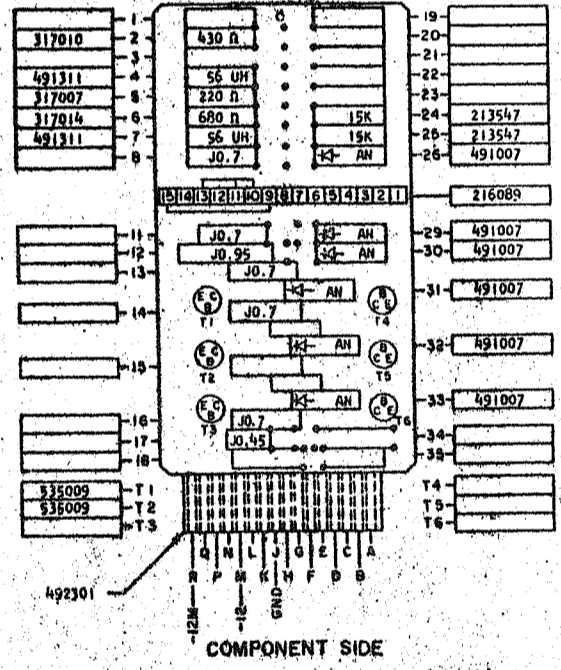
PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
D, A	T INPUT	[Waveform]	UP	1.4 6.2
E, B	T INPUT	[Waveform]	DOWN	-0.7 -6.2
F, C	T INPUT	[Waveform]	UP	1.4 6.2
F, C	T INPUT	[Waveform]	DOWN	-0.7 -6.2
H, H	U OUTPUT	[Waveform]	UP	-0.5 0.2
H, H	U OUTPUT	[Waveform]	DOWN	-7.4 -12.5
P	P OUTPUT	[Waveform]	UP	-4.93 -3.54
P	P OUTPUT	[Waveform]	DOWN	-8.82 -12.5
G	Y EXTENDER INPUT	[Waveform]	UP	+6
G	Y EXTENDER INPUT	[Waveform]	DOWN	0.0

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.10	0.80
TURN OFF	0.05	0.80

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.

NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS. EXAMPLE: LOGIC BLOCK DRIVING EF "ON".



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD ASH T3TR-CTDL - 3	DATE	62	CHANGE NO.	115999	APPROVAL		DATE		DEVELOPMENT NO.
DESIGN	WY "AND" PNP	MODEL	SMS							
DETAIL	BQ 3-1-62	SCALE	NONE							
CHECK	WH 3-1-62	DRAW	LIG 3-1-62							
APPRO		CHECK								

729830

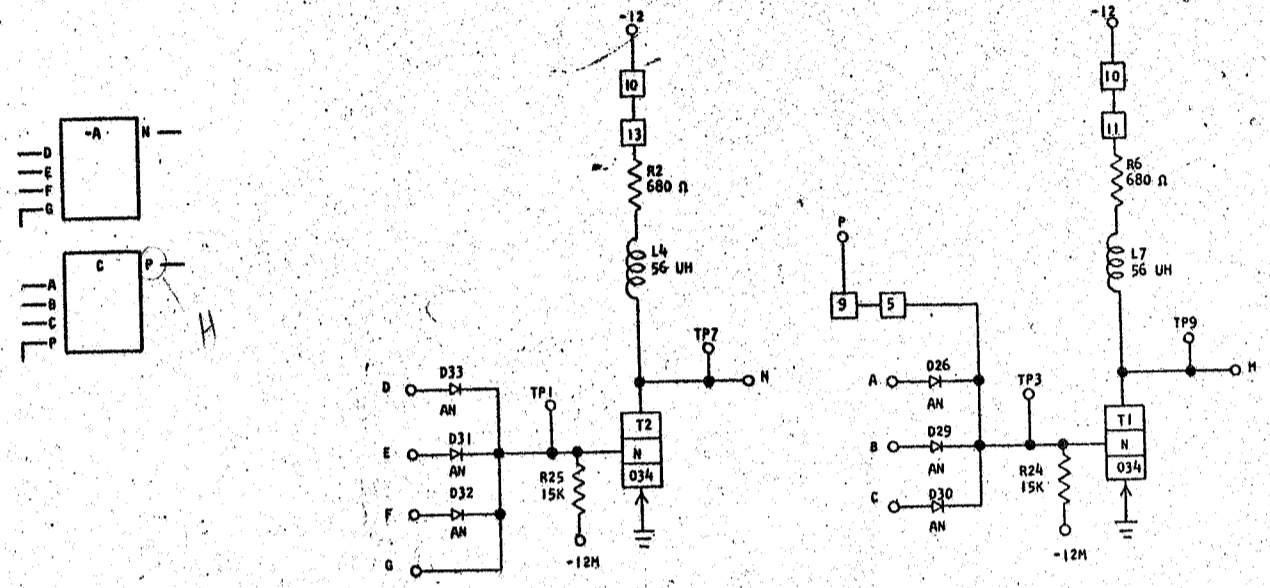
729830

STANDARDS CODE
729831

CARD CODE 729831
CJ YC

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371071

CTDL 3-WAY "AND" PNP
EXTENDABLE INPUTS



SEQUENCE OF OPERATION

1. ALL INPUTS DOWN TRANSISTOR ON OUTPUT UP
2. ANY INPUT UP TRANSISTOR OFF OUTPUT DOWN
3. INPUTS ON DIODE EXTENDER CARD MUST BE DOWN IN COINCIDENCE WITH INPUTS ON CARD FOR UP OUTPUT
4. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN

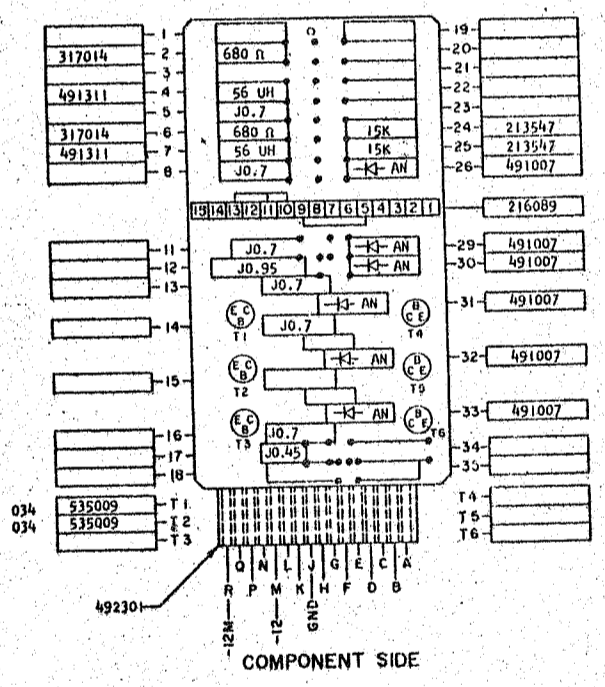
PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
D, A	T INPUT	[Waveform]	UP 1.44	6.24
E, B	T INPUT	[Waveform]	DOWN -0.74	-6.24
F, C	T INPUT	[Waveform]	UP 1.44	6.24
N, H	U OUTPUT	[Waveform]	DOWN -0.74	-6.24
G, P	EXTENDER INPUT	[Waveform]	UP 1.44	6.24
			DOWN -7.44	-12.5
			UP +6	
			DOWN 0.0	

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.10	0.80
TURN OFF	0.05	0.80*

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.

NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS. EXAMPLE: LOGIC BLOCK DRIVING OF "OR".



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM YSTR-CTDL-3 WAY	6-62	115599					
"AND" PNP-EXTENDABLE INPUTS							
DESIGN RQ 3-1-62							
CHECK MH 3-1-62							
APPROV							

729831

729832

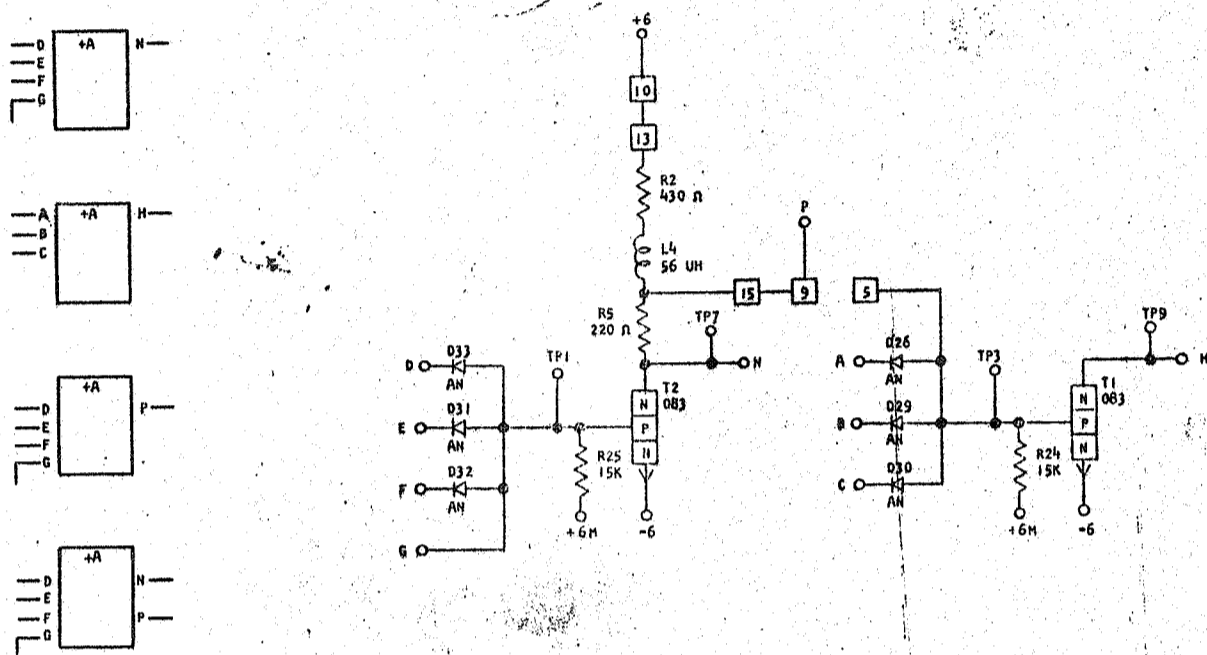
STANDARDS CODE

CARD CODE 729832
CK VU

REFERENCE DRAWING

SEE PRODUCTION DRAWING 371269

CTDL-3 WAY "AND" NPN ONE LOAD



SEQUENCE OF OPERATION

1. ALL INPUTS UP TRANSISTOR ON OUTPUT DOWN
2. ANY INPUT DOWN TRANSISTOR OFF OUTPUT UP
3. INPUTS ON EXTENDER CARD UP IN COINCIDENCE WITH UP INPUTS CARD FOR DOWN OUTPUT
4. T1 COLLECTOR MUST BE LOADED
5. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN

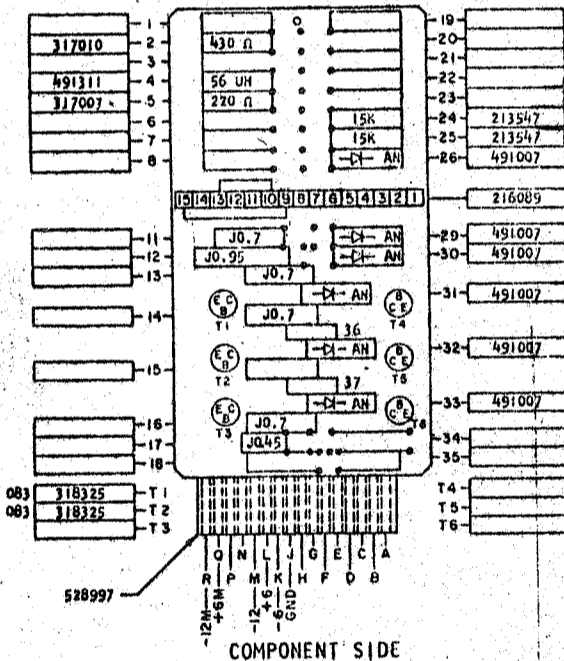
PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
D, A	U INPUT	[High]	UP	-5.26 0.24
E, B	U INPUT	[High]	DOWN	-7.44 -12.5
F, C	U INPUT	[High]	UP	-5.26 0.24
			DOWN	-7.44 -12.5
G	EXTENDER INPUT	[Pulse]	UP	-5.26 0.24
			DOWN	-7.44 -12.5
N, H	T OUTPUT	[Low]	UP	-6.0
			DOWN	-12.0
P	N OUTPUT	[High]	UP	1.44 6.24
			DOWN	+5.46 -6.24
			UP	2.82 6.24
			DOWN	-1.07 -2.40

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.05	0.70
TURN OFF	0.05	1.50*

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.

NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS.
EXAMPLE: LOGIC BLOCK DRIVING OF "OR"



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

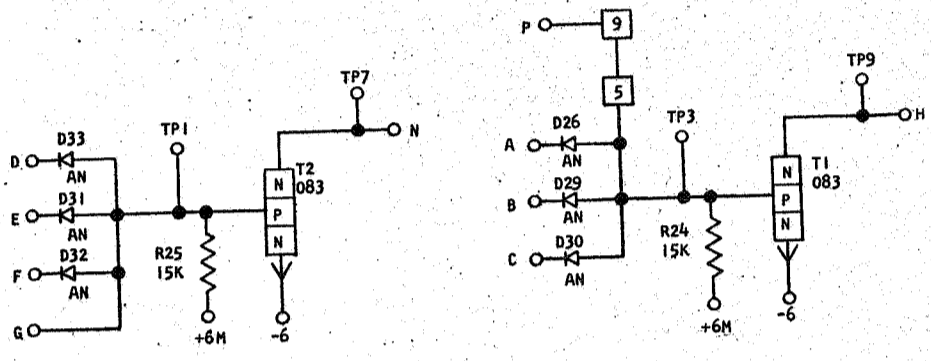
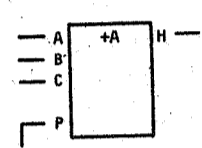
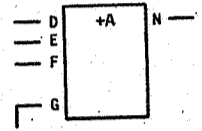
INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM ISTR-CTDL THREE				1/62	115599					729832
WAY "AND" NPN										
DESIGN	RQ	3-1-62	SCALE	NONE						
CHECK	WH	3-1-62	DRAW	LTG	3-17-62					
APPRO			CHECK							

729832

CARD CODE 729833
CK WF

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371270

CTDL-3-WAY "AND" NPN NO LOADS



SEQUENCE OF OPERATION

1. ALL INPUTS UP TRANSISTOR ON OUTPUT DOWN
2. ANY INPUT DOWN TRANSISTOR OFF OUTPUT UP
3. INPUTS ON EXTENDER CARD UP IN COINCIDENCE WITH UP INPUTS ON CARD FOR DOWN OUTPUT.
4. COLLECTORS MUST BE LOADED
5. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN.

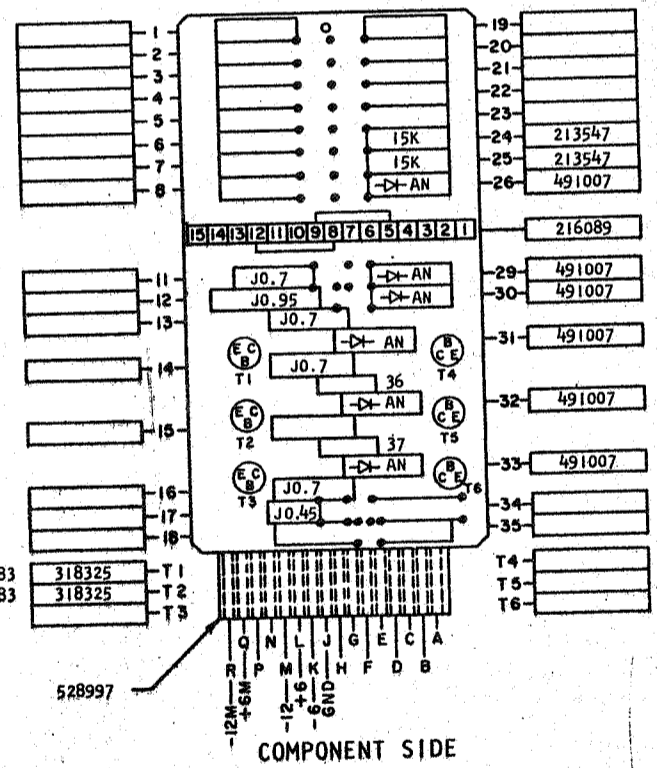
PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
D, A U	INPUT	[High]	UP -5.26	0.24
E, B U	INPUT	[High]	DOWN -7.44	-12.5
F, C U	INPUT	[High]	UP -5.26	0.24
G, P	EXTENDER INPUT	[High]	DOWN -7.44	-12.5
			UP -5.26	0.24
N, H T	OUTPUT	[High]	UP 1.44	6.24
			DOWN -5.46	-6.24

DELAY - USEC

TURN ON	MINIMUM 0.05	MAXIMUM 0.70
TURN OFF	0.05	1.50*

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.

NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS. EXAMPLE: LOGIC BLOCK DRIVING EF "OR".



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

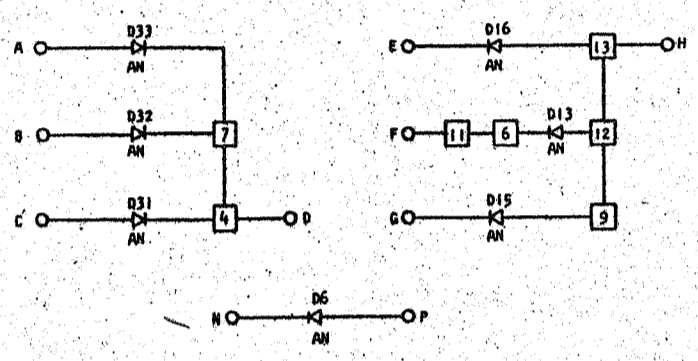
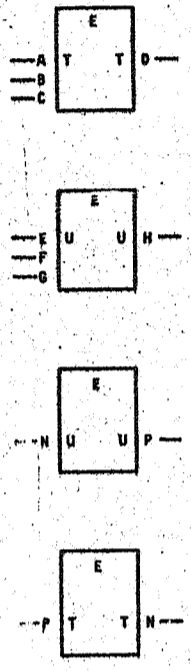
INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD ASH TSTR-CTDL - THREE	6-1-62	115599					729833
WAY	"AND" NPN-NO LOADS							
DESIGN	RQ 3-1-62	MODEL	SMS					
DETAIL	WH 3-1-62	SCALE	NONE					
CHECK	WH 3-1-62	DRAW	LIG 3-17-62					
APPRO		CHECK						

STANDARDS CODE
729836

CARD CODE 729836
CL VQ

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371255

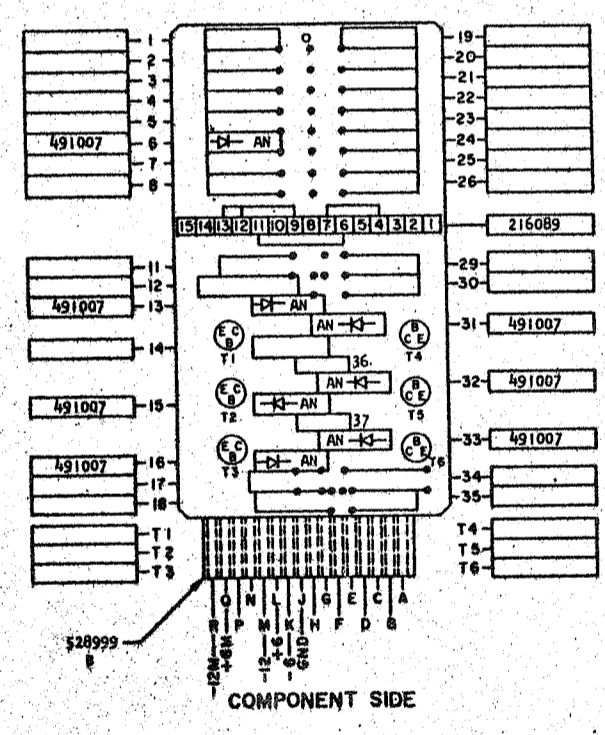
CTDL EXTENDER CARD



SEQUENCE OF OPERATION

1. OUTPUT FROM PIN D EXPANDS INPUTS TO N TYPE BLOCK
2. OUTPUT FROM PIN H EXPANDS INPUTS TO P TYPE BLOCK
3. D6 USED TO EXPAND INPUTS TO P OR N TYPE BLOCK BY REVERSING CONNECTIONS ON TERMINAL PINS

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
A	T	INPUT	UP 1.44	6.24
			DOWN -0.74	-6.24
B	T	INPUT	UP 1.44	6.24
			DOWN -0.74	-6.24
C	T	INPUT	UP 1.44	6.24
			DOWN -0.74	-6.24
D	T	EXTENDER OUTPUT	UP +6	
			DOWN 0.0	
E	U	INPUT	UP -5.26	0.24
			DOWN -7.44	-12.5
F	U	INPUT	UP -5.26	0.24
			DOWN -7.44	-12.5
G	U	INPUT	UP -5.26	0.24
			DOWN -7.44	-12.5
H	U	EXTENDER OUTPUT	UP -6	
			DOWN -12	



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD ASN YSTR - CTDL			6 27-62	115599					
EXTENDER CARD										
DESIGN		MODEL	SMS							
DETAIL NO	3-1-62	SCALE	NONE							
CHECK	MH	3-1-62	DRAW	LIG	3-1-62					
APPRO			CHECK							

C

729836

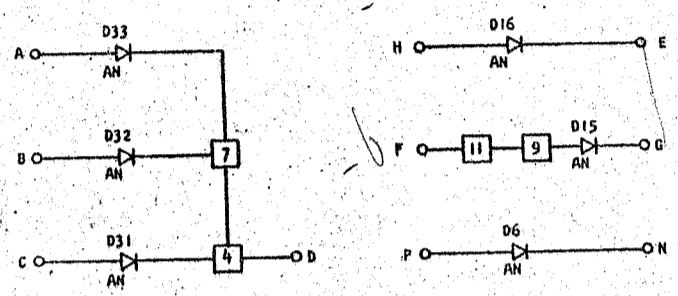
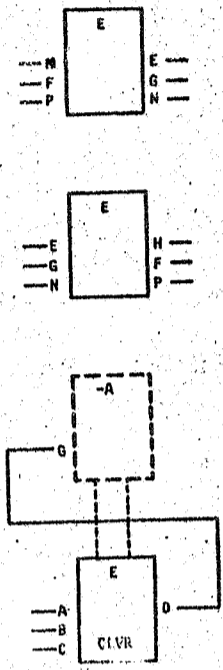
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STANDARD CODE

CARD CODE 729837
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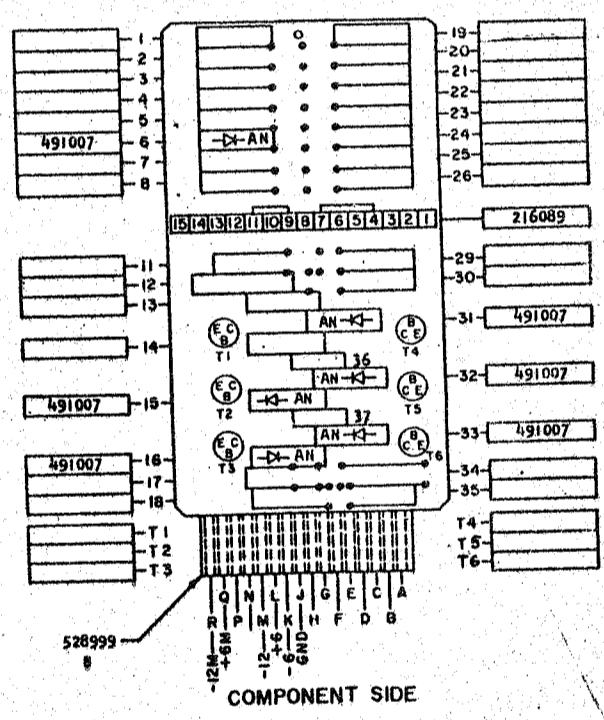
REFERENCE DRAWING
SEE PRODUCTION DRAWING 371075

CTDL EXTENDER CARD



- SEQUENCE OF OPERATION
1. ALL INPUTS DOWN IN COINCIDENCE WITH INPUTS ON OUTPUT CARD FOR EXTENDER DOWN OUTPUT
 2. ANY INPUT UP WILL GIVE UP EXTENDER OUTPUT
 3. D6, D15, D16 EXPAND INPUTS TO BOTH P & N TYPE BLOCKS HAVING EXTENDER INPUTS, BY REVERSING CONNECTIONS ON TERMINAL PINS

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
A	T INPUT	[Waveform]	UP 1.44	6.24
			DOWN -0.74	-6.24
B	T INPUT	[Waveform]	UP 1.44	6.24
			DOWN -0.74	-6.24
C	T INPUT	[Waveform]	UP 1.44	6.24
			DOWN -0.75	-6.24
D	T EXTENDER OUTPUT	[Waveform]	UP 1.44	6.24
			DOWN -0.5	0.2



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR - CTDL				2-26-62	115599					
EXTENDER CARD										
DESIGN	RQ	3-1-62	MODEL	SMS						
DETAIL	WH	3-1-62	SCALE	NONE						
CHECK	WH	3-1-62	DRAW	LIG 3-17-62						
APPRO			CHECK							

729837

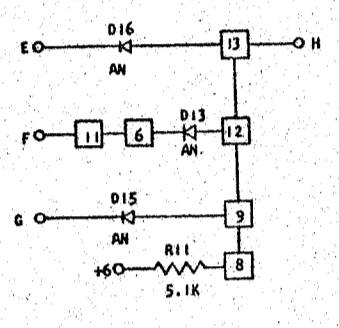
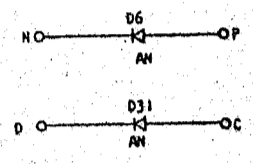
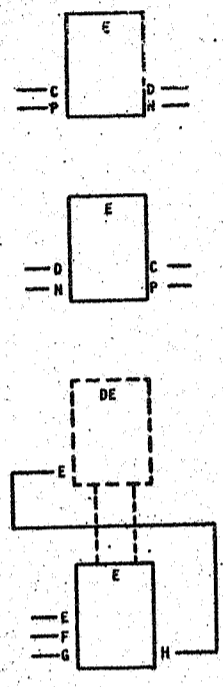
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STANDARDS CODE

CARD CODE 729838
CL VS

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371074

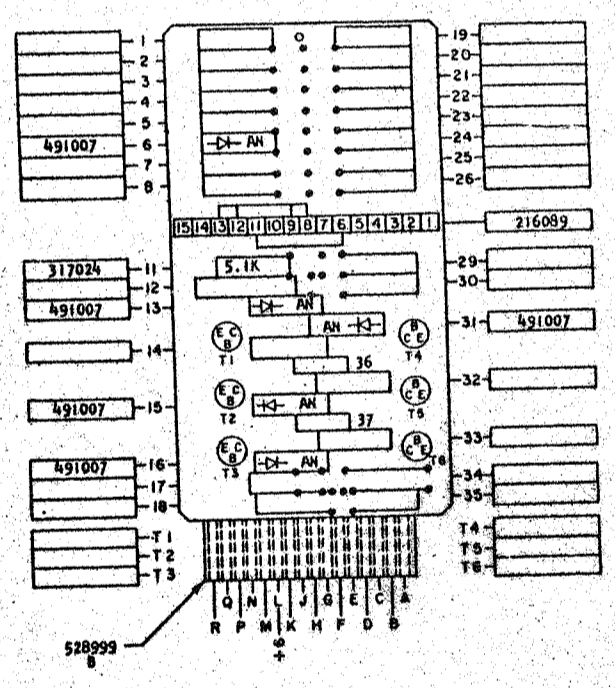
CTDL -N "OR" EXTENDER CARD



SEQUENCE OF OPERATION

1. OUTPUT FROM PIN H EXPANDS THE INPUTS TO DE CARD & PREFORMS - OR FUNCTION
2. D6, D31 EXPAND INPUTS TO BOTH P & N TYPE BLOCKS BY REVERSING CONNECTIONS ON TERMINAL PINS

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
E	T	INPUT	UP	1.81 6.24
			DOWN	-1.74 -6.24
F	T	INPUT	UP	1.81 6.24
			DOWN	-1.74 -6.24
G	T	INPUT	UP	1.81 6.24
			DOWN	-1.74 -6.24
H	T	EXTENDER OUTPUT	UP	1.81 6.24
			DOWN	-1.74 -6.24



COMPONENT SIDE

CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD ASM TSTR CTDL-N			2-27-62	115599					
	"OR" EXTENDER CARD									
DESIGN		MODEL	SMS							
DETAIL	RD 3-1-62	SCALE	NONE							
CHECK	WH 3-1-62	DRAW	LIG 13-1-62							
APPROV		CHECK								

729838

STANDARDS CODE

7298

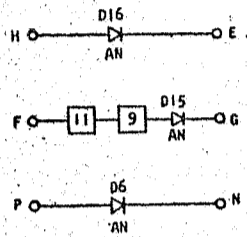
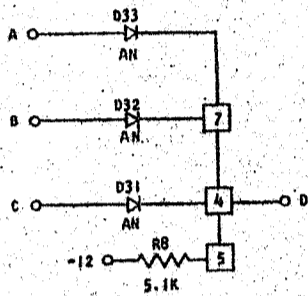
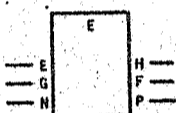
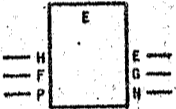
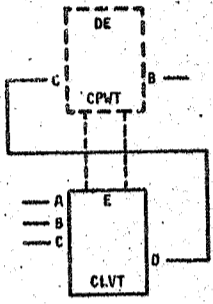
CARD CODE 729839

CL VT

REFERENCE DRAWING

SEE PRODUCTION DRAWING 371073

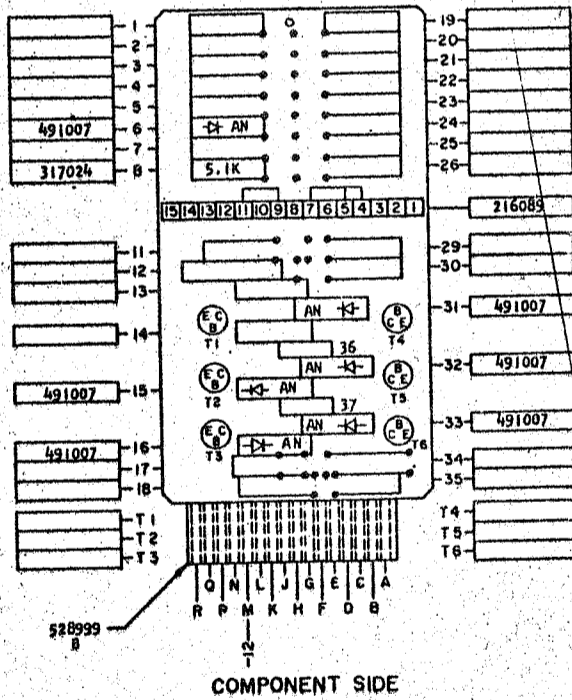
CTDL +P "OR" EXTENDER CARD



SEQUENCE OF OPERATION

1. OUTPUT FROM PIN D EXPANDS THE INPUTS TO DE CARD & PERFORMS + OR FUNCTION
2. D6, D15, D16, EXPAND INPUTS TO BOTH P & N TYPE BLOCKS BY REVERSING PIN CONNECTIONS

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
A U	INPUT		UP	-4.26 0.24
			DOWN	-7.81 -12.5
B U	INPUT		UP	-4.26 0.24
			DOWN	-7.81 -12.5
C U	INPUT		UP	-4.26 0.24
			DOWN	-7.81 -12.5
D U	EXTENDER OUTPUT		UP	-4.26 0.24
			DOWN	-7.81 -12.5



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR CTDL +P				6-29-62	115599					
"OR" EXTENDER CARD										
DESIGN	MODEL	SMS								
DETAIL NO	3-1-62	SCALE	NONE							
CHECK	VH	3-1-62	DBAW	LIG	3-17-62					
APPRO	CHECK									

729839

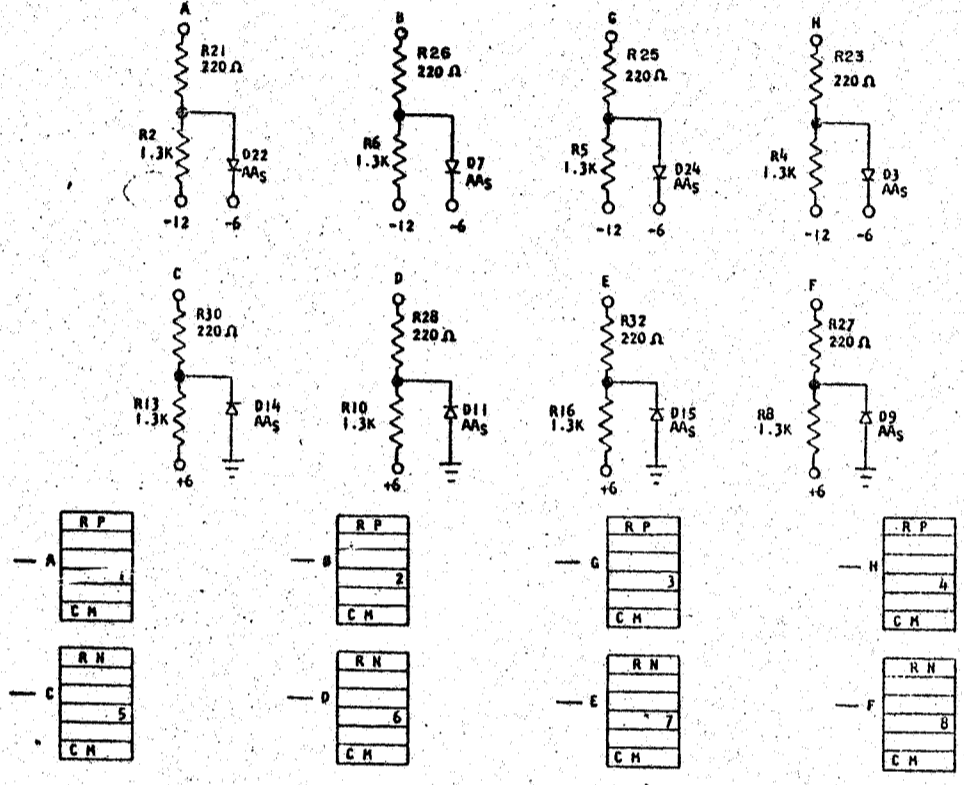
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CARD CODE 729840
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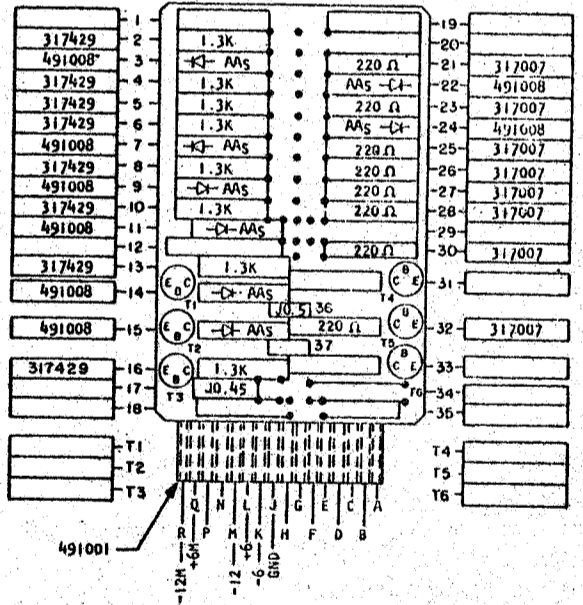
SEE PRODUCTION DRAWING 371256

CTDL - COUPLING NETWORK



SEQUENCE OF OPERATION

1. COLLECTOR LOADING FOR CURRENT MODE LOGIC BLOCKS
2. A, B, G, H, PROVIDE P LEVEL OUTPUTS; C, D, E, F, PROVIDE N LEVEL OUTPUTS
3. FOR DELAY DATA REFER TO THE GENERAL INFORMATION ON CTDL DELAY UNDER CURRENT MODE TO CTDL COUPLING.



COMPONENT SIDE

INTERNATIONAL BUSINESS MACHINES CORP.							
NAME	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
CARD ASM TSTR - CTDL	3-1-62	115599					
COUPLING NETWORK							
DESIGN	RQ	MODEL	SPIS				
DETAIL	3-1-62	SCALE	NONE				
CHECK	MH	DRAW	LIG	3-17-62			
APPRO		CHECK					

CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

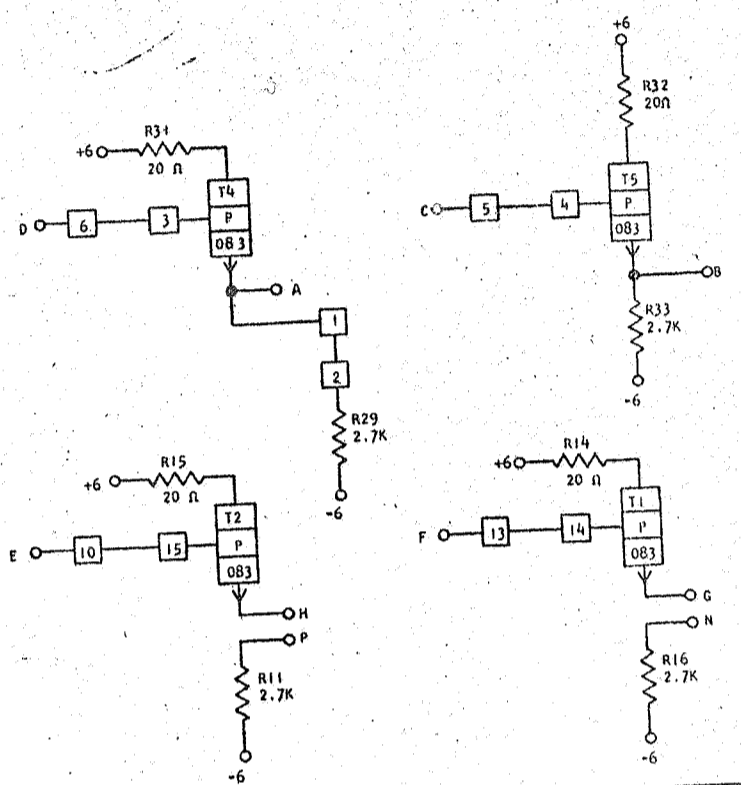
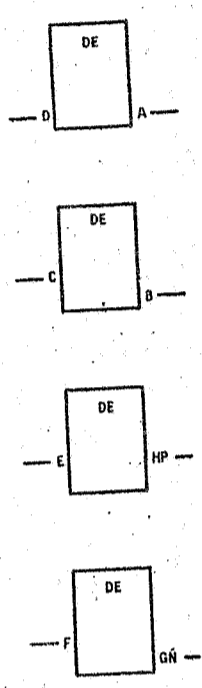
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STANDARDS CODE
729841

CARD CODE 729841
CN WT.

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371260

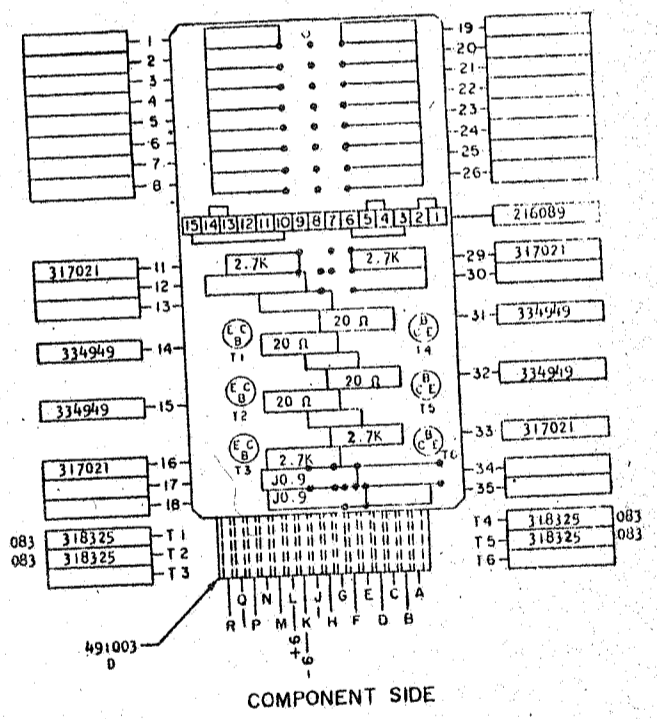
CTDL - EMITTER FOLLOWER NPN



- SEQUENCE OF OPERATION
1. OUTPUT WILL FOLLOW INPUT, TRANSISTOR ALWAYS IN CONDUCTION
 2. LOGICAL FUNCTIONS PERFORMED WHEN OUTPUTS SHARE COMMON LOAD
 3. T1, T2, EMITTER MUST BE LOADED

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
C, D, E, F	T	INPUT	UP: 1.9	6.24
			DOWN: -5.46	-6.24
A, B, H, P	T	OUTPUT	UP: 1.44	6.24
			DOWN: -0.74	-6.24

DELAY
THERE IS NO APPRECIABLE DELAY BETWEEN THE INPUT AND THE OUTPUT OF THE EF WHEN THE LOGIC BLOCK THAT DRIVES THE EF IS TURNED OFF.
WHEN THE LOGIC BLOCK THAT DRIVES THE EF IS TURNED ON, THE EF DELAY IS A FUNCTION OF ITS CAPACITIVE LOAD (EXAMPLE: WIRING CAPACITANCE). IN SOME CIRCUIT APPLICATIONS, THIS DELAY CAN BE IN THE ORDER OF 3 OR 4 USEC. IN NORMAL APPLICATION (NO APPRECIABLE WIRING CAPACITANCE ON THE OUTPUT OF THE EF) THE DELAY IS NOT APPRECIABLE.



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
MODEL	CARD ASM TSTR - CTDL			4-62	115599					
DESIGN	EMITTER FOLLOWER NPN	MODEL	SMS							
DETAIL RQ	3-1-62	SCALE	NONE							
CHECK WH	3-1-62	DRAW	LIG 3-17-62							
APPRO		CHKD								

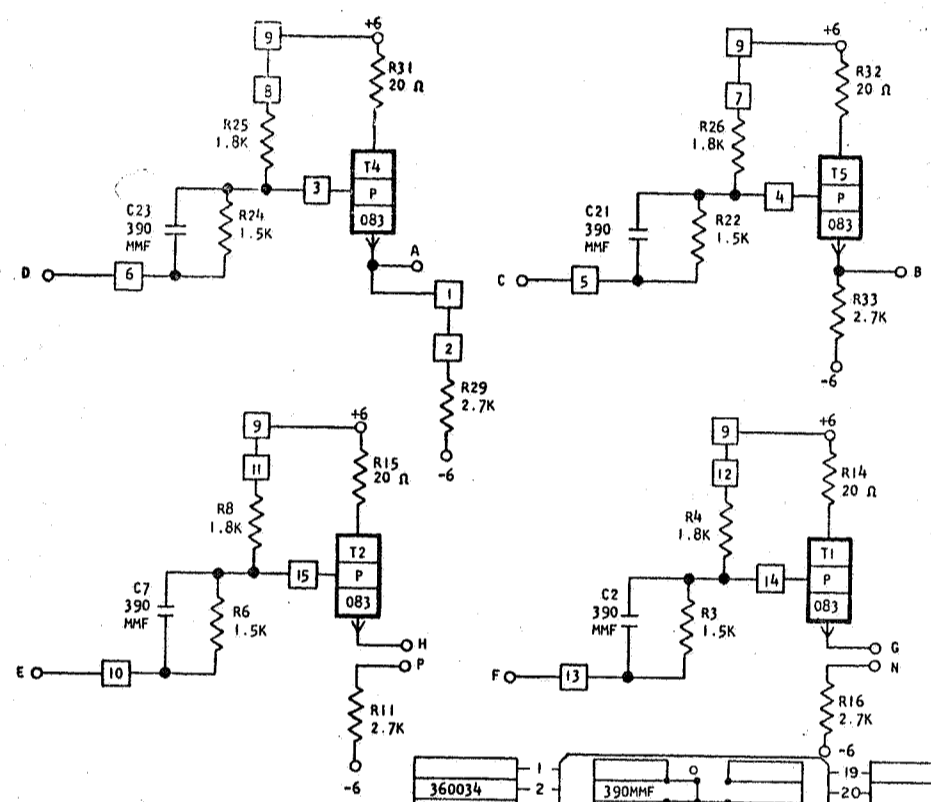
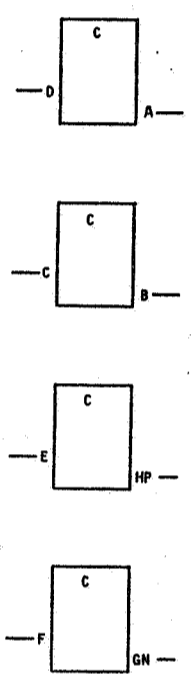
729841

STANDARDS CODE
729842

CARD CODE 729842
CN WU

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371258

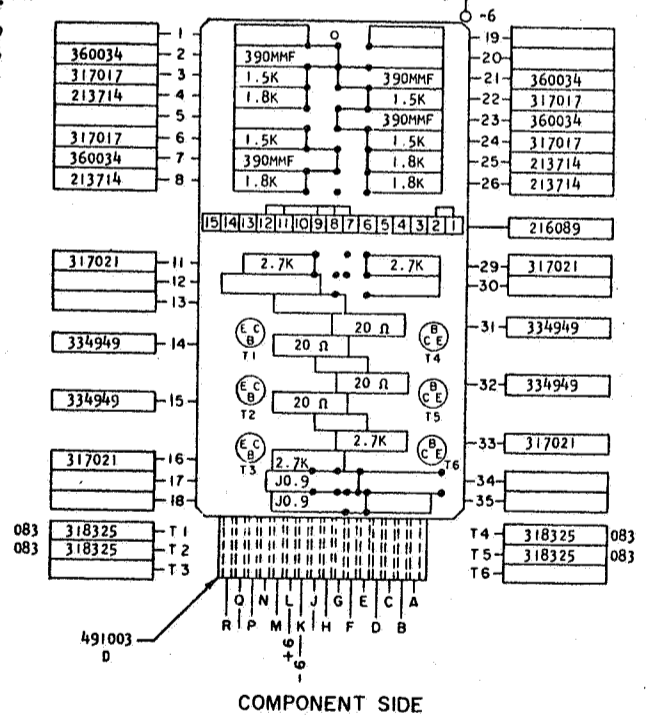
CTDL-TRANSLATE BLOCK NPN



- SEQUENCE OF OPERATION**
1. TRANSISTOR ALWAYS IN CONDUCTION; T1, T2, EMITTER MUST BE LOADED
 2. OUTPUT WILL FOLLOW INPUT
 3. LOGICAL FUNCTIONS PERFORMED WHEN OUTPUTS SHARE COMMON LOAD

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
D, C, E, F	U INPUT	[Square Wave]	UP	-0.54 0.24
A, B, H, G	T OUTPUT	[Square Wave]	DOWN	-7.44 -12.5
			UP	1.44 3.12
			DOWN	-0.74 -5.23

DELAY
THE DELAY CHARACTERISTICS OF THE TRANSLATE BLOCK ARE SIMILAR TO THOSE OF THE EF.
NO APPRECIABLE DELAY SHOULD BE NOTICED WHEN THE DRIVING BLOCK IS TURNED ON OR OFF.
APPRECIABLE DELAY CAN BE OBSERVED (1 TO 2.5 USEC.) WHEN THE DRIVING BLOCK IS TURNED ON AND THE OUTPUT OF THE TRANSLATE BLOCK IS DRIVING SIGNIFICANT WIRING CAPACITANCE (SEVERAL FEET OF WIRE FROM ONE GATE TO ANOTHER.)



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

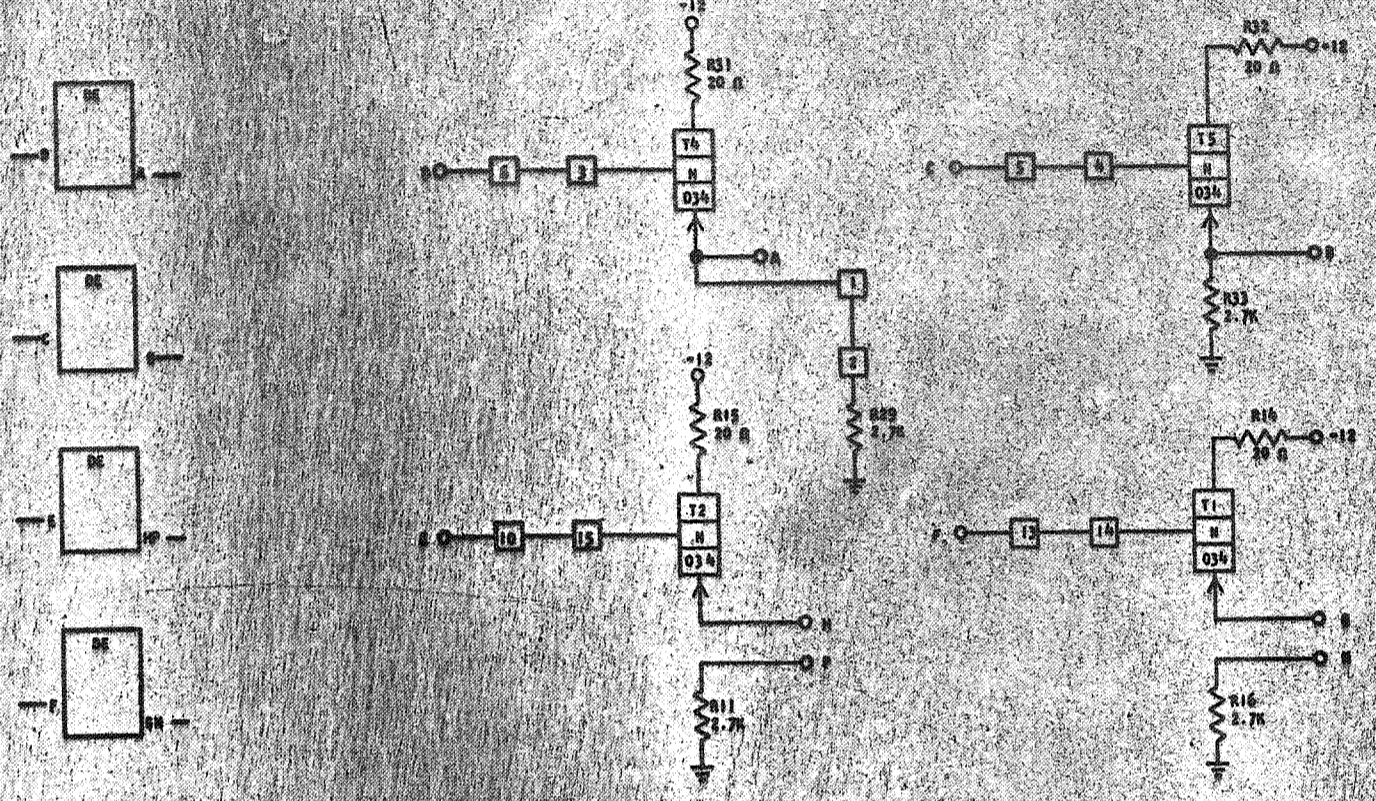
INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR - CTDL				-62	115599					729842
TRANSLATE BLOCK NPN										
DESIGN	RQ	3-1-62	MODLL	SMS						
DETAIL	WH	3-1-62	SCALE	NONE						
CHECK	WH	3-1-62	DRAW	LTC	3-17-62					
APPRO			CHECK							

729843

729843
CP WT

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371259

CTDL - EMITTER FOLLOWER PNP

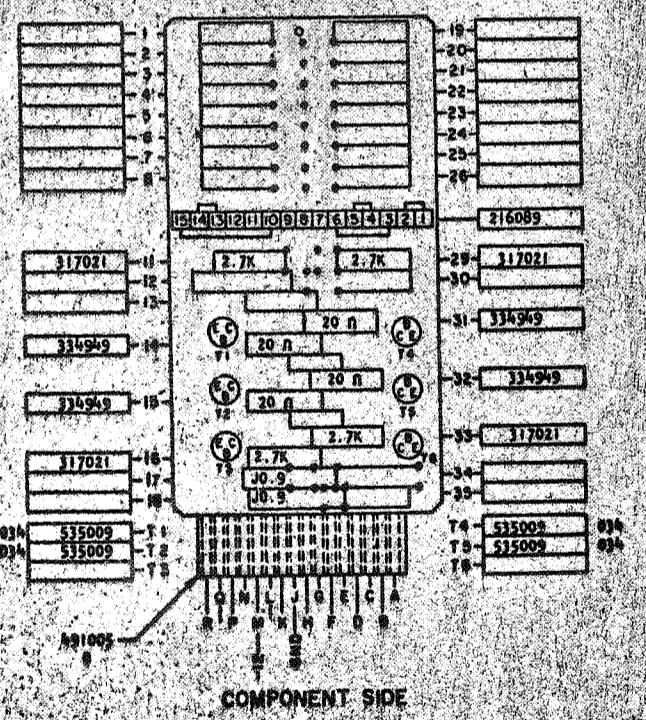


- SEQUENCE OF OPERATION**
1. OUTPUT WILL FOLLOW INPUT, TRANSISTOR ALWAYS IN CONDUCTION
 2. LOGICAL FUNCTIONS PERFORMED WHEN OUTPUTS SHARE COMMON LOAD
 3. T1, T2 EMITTER MUST BE LOADED

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
D, C, E, F	INPUT	[Square Wave]	UP	-5.5 +2.20
A, B, H, G	OUTPUT	[Square Wave]	UP	+5.3 0.2
			DOWN	-7.6 -12.5
			DOWN	+7.4 -12.5

DELAY
THERE IS NO APPRECIABLE DELAY BETWEEN THE INPUT AND THE OUTPUT OF THE EF WHEN THE LOGIC BLOCK THAT DRIVES THE EF IS TURNED OFF.

WHEN THE LOGIC BLOCK THAT DRIVES THE EF IS TURNED ON, THE EF DELAY IS A FUNCTION OF ITS CAPACITIVE LOAD (EXAMPLE: WIRING CAPACITANCE). IN SOME CIRCUIT APPLICATIONS, THIS DELAY CAN BE IN THE ORDER OF 3 OR 4 USEC. IN NORMAL APPLICATION (NO APPRECIABLE WIRING CAPACITANCE ON THE OUTPUT OF THE EF) THE DELAY IS NOT APPRECIABLE.



CIRCUIT AND PACKAGING STANDARDS	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.	DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM. TSTR - CTDL	6-29-62	EC 115599					
EMITTER FOLLOWER PNP	3-4-63	JT 83687					
DESIGN	MODEL	SMS					
DETAIL	REQ	3-1-62	SCALE	NONE			
CHECK	WH	3-1-62	DRAW	LIG	3-17-62		
APPROV	CHECK						

C

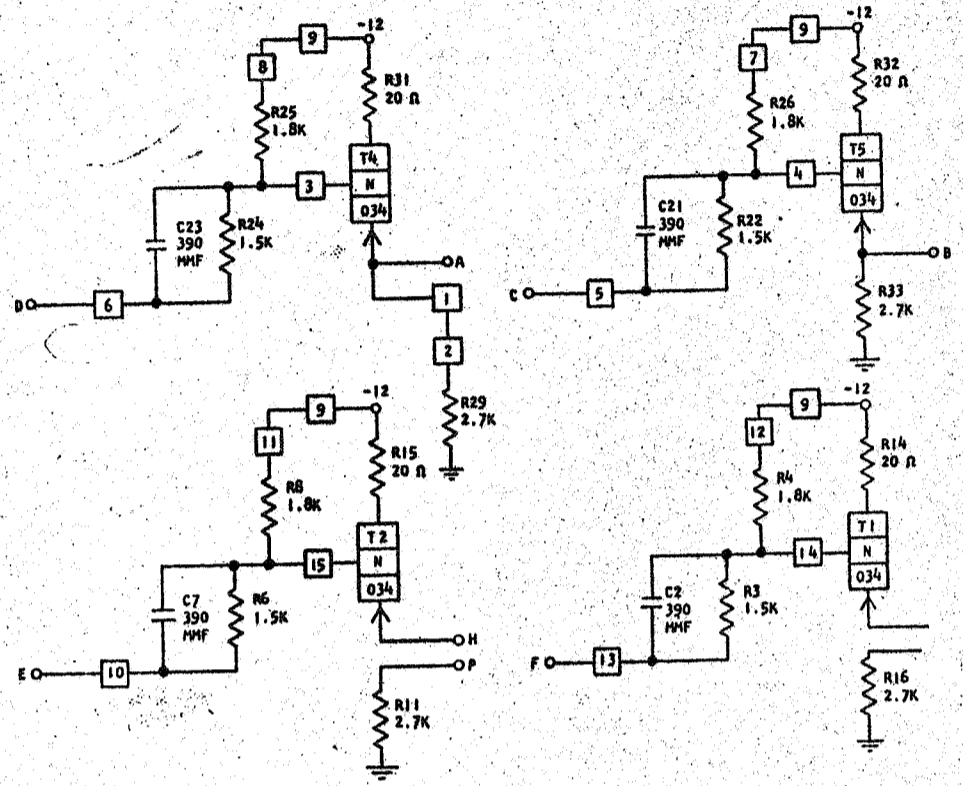
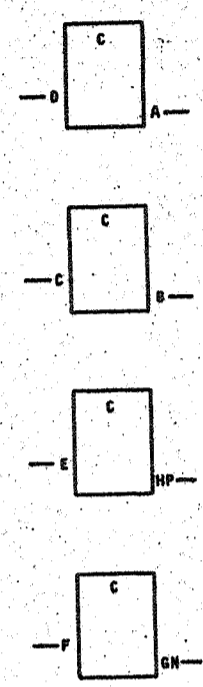
729843

STANDARDS CODE
729844

CARD CODE 729844
CP WU

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371257

CTDL - TRANSLATE BLOCK - PNP

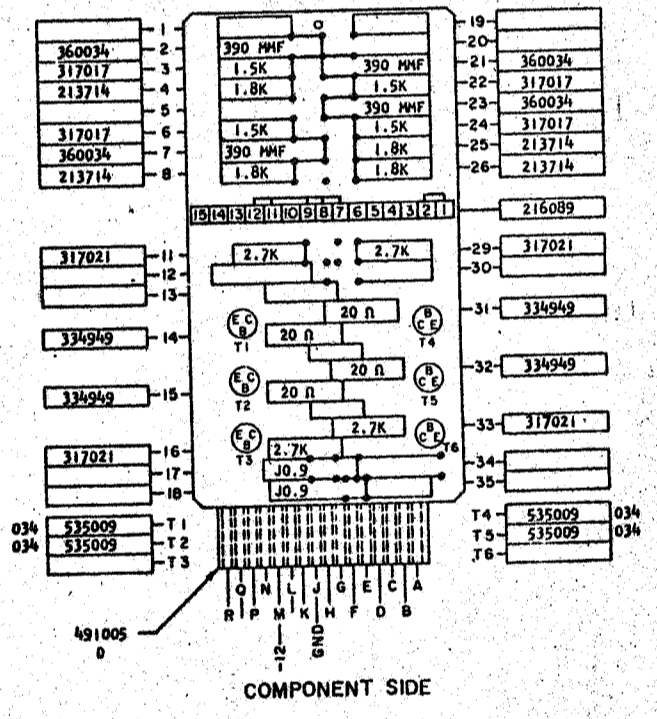


SEQUENCE OF OPERATION

1. OUTPUT WILL FOLLOW INPUT, TRANSISTOR ALWAYS IN CONDUCTION
2. LOGICAL FUNCTIONS PERFORMED WHEN OUTPUTS SHARE COMMON LOAD
3. T1, T2 EMITTER MUST BE LOADED.

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
D, C E, F	T	INPUT	UP DOWN	1.44 -5.5 -6.24
A, B H, G	U	OUTPUT	UP DOWN	-5.2 -0.8 -7.4 -9.2

DELAY
THE DELAY CHARACTERISTICS OF THE TRANSLATE BLOCK ARE SIMILAR TO THOSE OF THE EP.
NO APPRECIABLE DELAY SHOULD BE NOTICED WHEN THE DRIVING BLOCK IS TURNED ON OR OFF.
APPRECIABLE DELAY CAN BE OBSERVED (1 TO 2.5 USEC.) WHEN THE DRIVING BLOCK IS TURNED ON AND THE OUTPUT OF THE TRANSLATE BLOCK IS DRIVING SIGNIFICANT WIRING CAPACITANCE (SEVERAL FEET OF WIRE FROM ONE GATE TO ANOTHER).



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD ASM TSTR -CTDL			-62	115599					729844
DESIGN	TRANSLATE BLOCK - PNP	MODEL	SHS							
DETAIL	RQ 3-1-62	SCALE	NONE							
CHECK	WH 3-1-62	DRAW	LIG 3-17-62							
APPRO		CHECK								

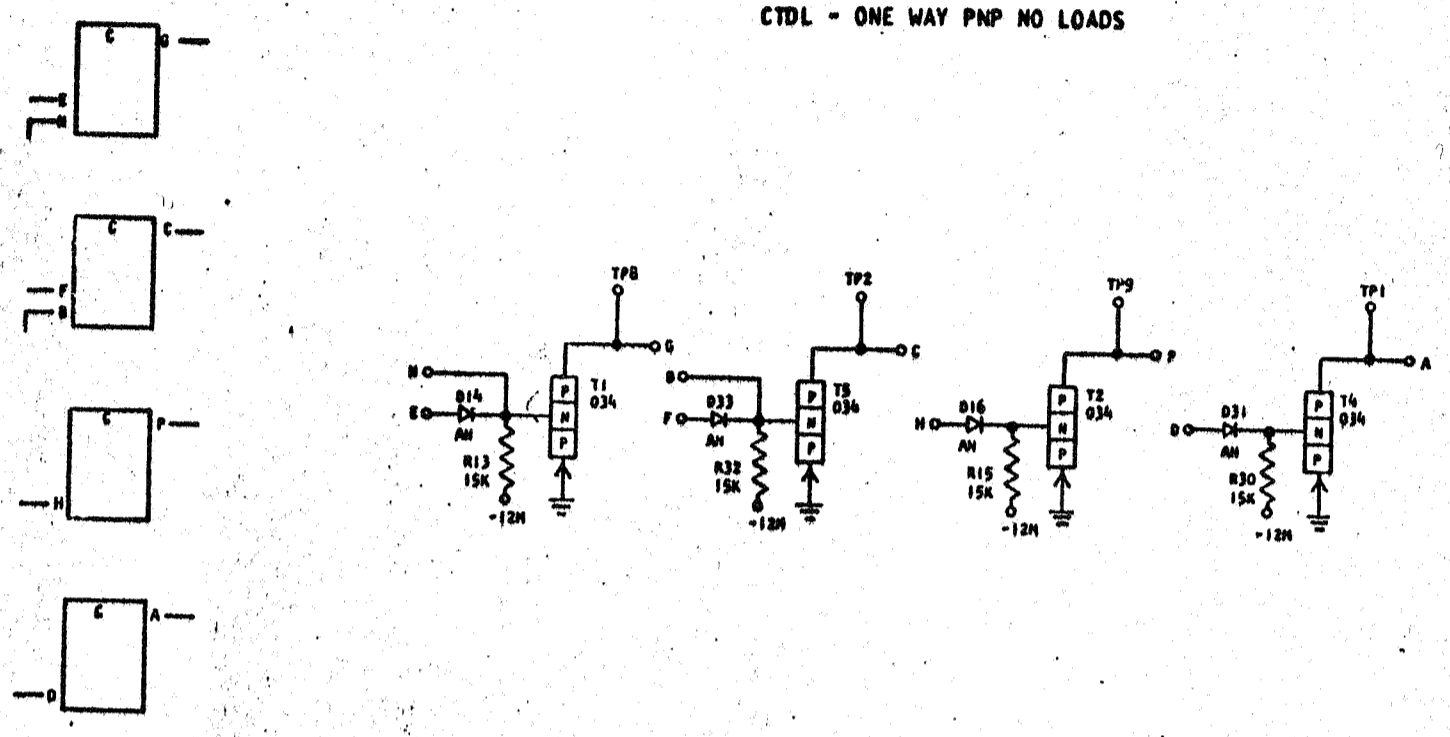
729844

729845

CARD CODE 729845
CQ --

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371273

CTDL - ONE WAY PNP NO LOADS



SEQUENCE OF OPERATION

1. DOWN INPUT TRANSISTOR ON OUTPUT UP
2. UP INPUT TRANSISTOR OFF OUTPUT DOWN
3. INPUTS ON EXTENDER CARD DOWN IN COINCIDENCE WITH DOWN INPUT ON CARD FOR UP OUTPUT
4. COLLECTORS MUST BE LOADED
5. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN

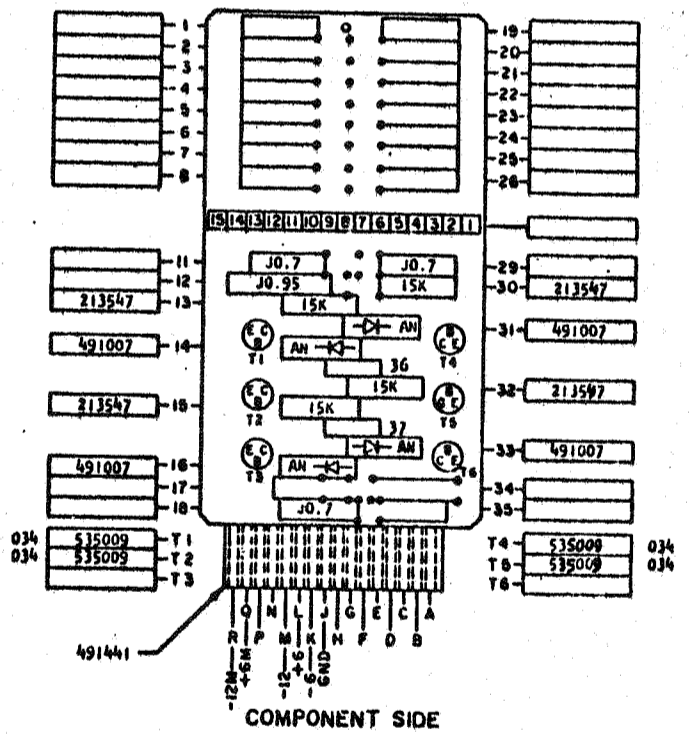
PINS	SIGNAL NAME	WAVE SHAPE	LEVELS		
			MIN	MAX	
E, F, H, D	T INPUT		UP	1.44	6.24
			DOWN	-0.74	-6.24
H, B	EXTENDER INPUT		UP	+6.0	
			DOWN	0.0	
G, C, P, A	U OUTPUT		UP	-0.54	0.24
			DOWN	-7.44	-12.5

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.10	0.80
TURN OFF	0.05	0.80

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.

NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS. EXAMPLE: LOGIC BLOCK DRIVING EF 'DN'.



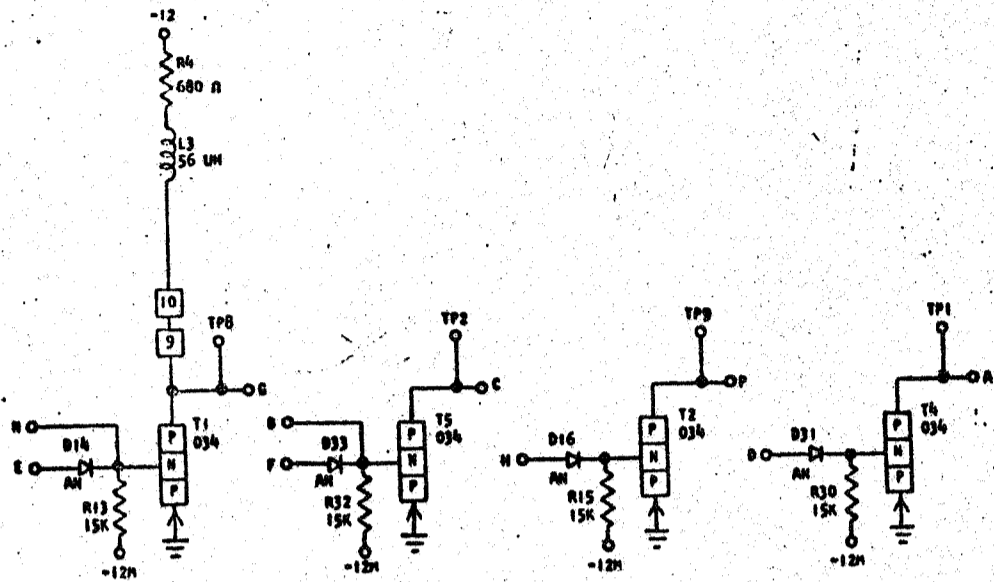
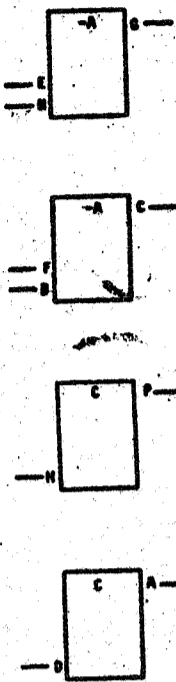
CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR -CTDL-ONE				/ / 62	115599					
MAY PNP NO LOADS										
DESIGN	RQ	MODEL	SMS							
DETAIL	RD	3-1-62	SCALE	NONE						
CHECK	VM	3-1-62	DRAW	LIG	3-17-62					
APPD			CHECK							

729845

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371278

CTDL - ONE WAY PNP



SEQUENCE OF OPERATION

1. INPUT DOWN TRANSISTOR ON OUTPUT UP
2. INPUT UP TRANSISTOR OFF OUTPUT DOWN
3. INPUTS ON EXTENDER CARD MUST BE DOWN IN COINCIDENCE WITH INPUT ON BOARD FOR UP OUTPUT
4. T5, T2, T4, COLLECTORS MUST BE LOADED
5. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN

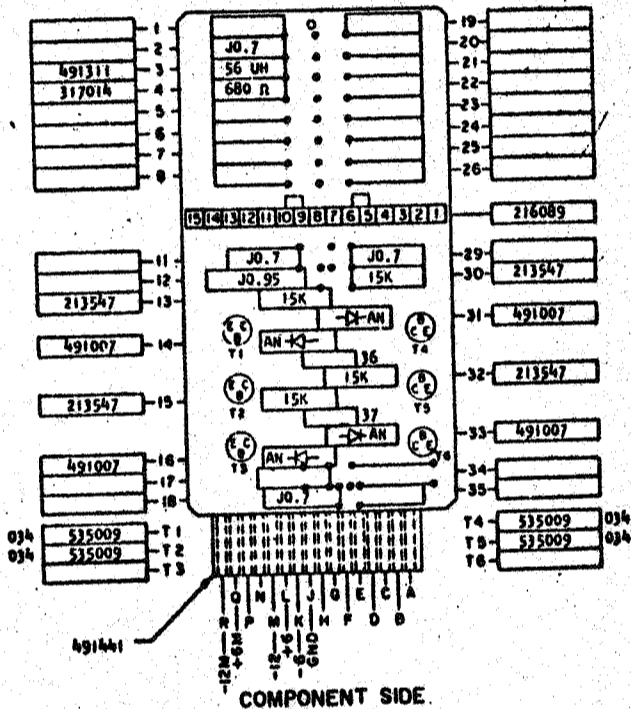
PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
E, F, T	INPUT	[Waveform]	UP 1.44	6.24
N, B	EXTENDER INPUT	[Waveform]	DOWN -0.74	-6.24
G, C, U	OUTPUT	[Waveform]	UP +6	
H, D, Y	INPUT	[Waveform]	DOWN 0.0	
P, A, V	OUTPUT	[Waveform]	UP -0.54	0.24
			DOWN -7.44	-12.5

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.10	0.80
TURN OFF	0.05	0.80

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.

NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS. EXAMPLE: LOGIC BLOCK DRIVING EF 'OR'.



COMPONENT SIDE

CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.	
NAME	CARD ASH TSTR-CTDL-ONE	DATE	4-29-62	CHANGE NO.	EC115599	APPROVAL		DATE		DEVELOPMENT NO.	729846
	WAY PNP	DATE	30.6.63	CHANGE NO.	JTB3687	APPROVAL		DATE		DEVELOPMENT NO.	
DESIGN	NO	SCALE	3-1-62	SCALE	NONE						
CHECK	MN	DRAW	3-1-62	DRAW	LIG	3-17-62					
APPROV		CHECK		CHECK							

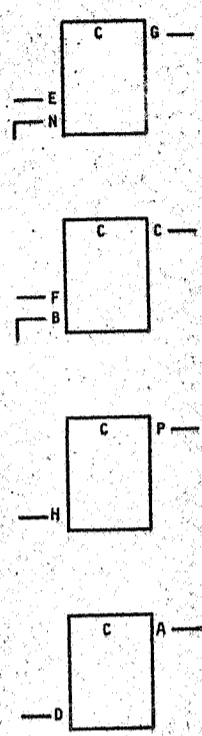
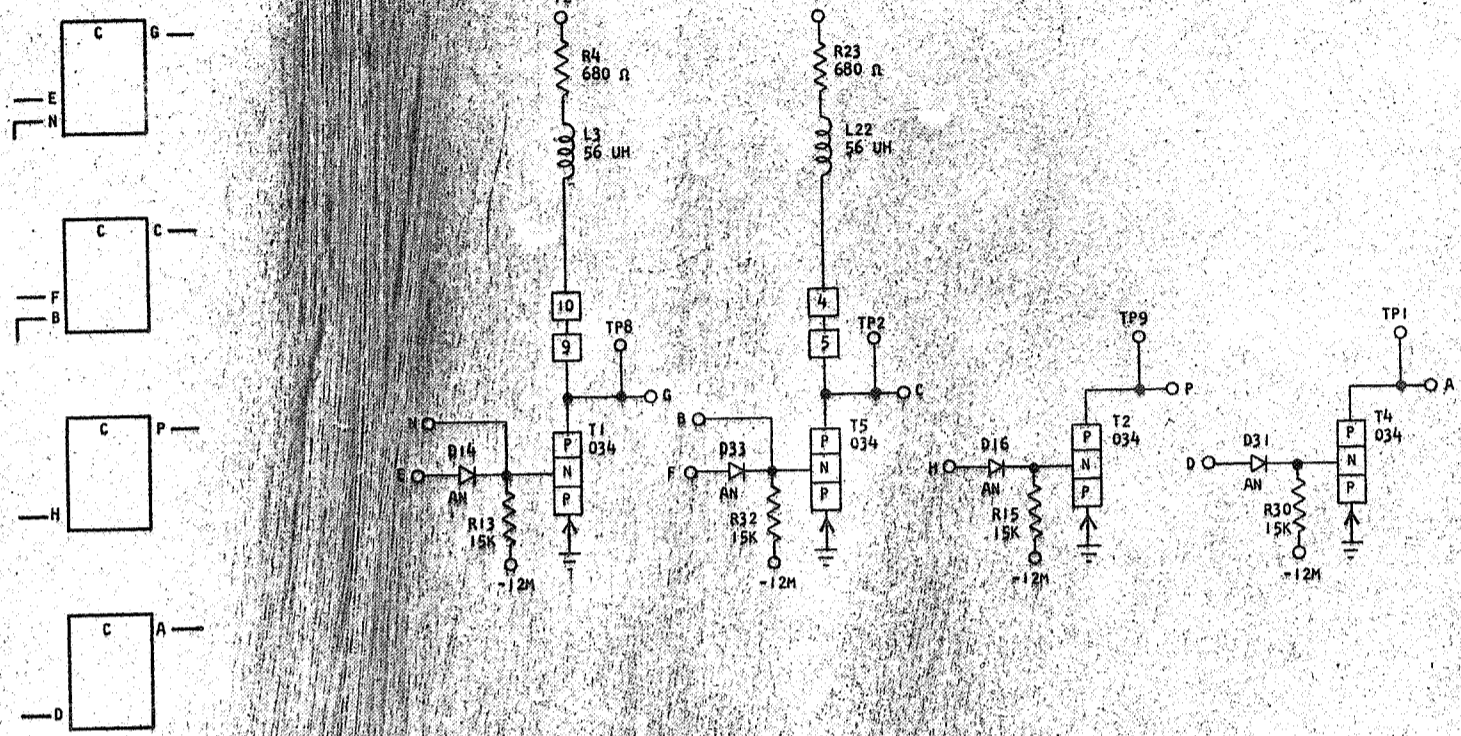
729846

STANDARDS CODE

CARD CODE 729847
CQ ZT

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371272

CTDL - ONE WAY PNP 2 LOADS
FOUR ON CARD



SEQUENCE OF OPERATION

1. INPUT DOWN TRANSISTOR ON OUTPUT UP
2. INPUT UP TRANSISTOR OFF OUTPUT DOWN
3. INPUTS ON EXTENDER DOWN IN COINCIDENCE WITH DOWN INPUT ON CARD FOR UP OUTPUT
4. T2, T4 COLLECTORS MUST BE LOADED
5. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN

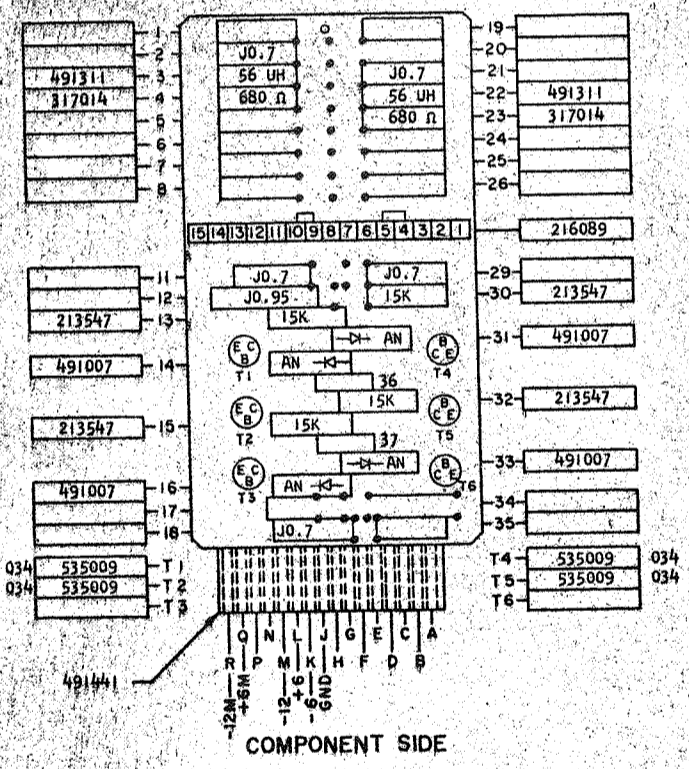
PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
E, F, H, D	T INPUT	[Waveform]	UP 1.44	6.24
			DOWN -0.74	-6.24
N, B	EXTENDER INPUT	[Waveform]	UP	+6.0
			DOWN	0.0
G, C, P, A	U OUTPUT	[Waveform]	UP -0.54	0.24
			DOWN -7.44	-12.5

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.10	0.80
TURN OFF	0.05	0.80

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.

NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS. EXAMPLE: LOGIC BLOCK DRIVING EF "OR".



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME CARD ASM TSTR-CTDL-ONE				6-27-62	115599					729847
WAY PNP 2 LDS-FOUR ON CARD										
DESIGN	RQ	3-1-62	SCALE	SMS						
DETAIL	LN	3-1-62	DRAW	NONE						
CHECK	LN	3-1-62	DRAW	LIG	3-17-62					
APPROV			CHECK							

729847

729848

STANDARDS CODE

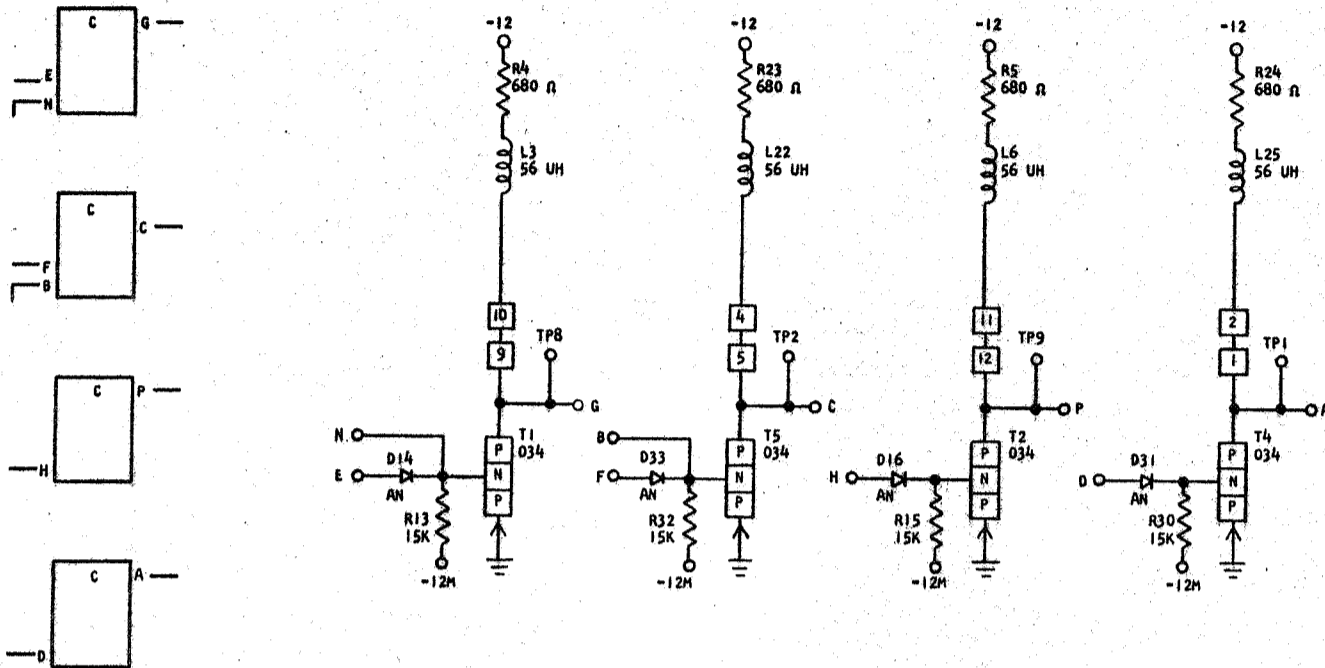
CARD CODE

729848

CQ ZV

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371271

**CTDL - ONE WAY PNP 4 LOADS
FOUR ON CARD**



SEQUENCE OF OPERATION

1. DOWN INPUT TRANSISTOR ON OUTPUT UP
2. UP INPUT TRANSISTOR OFF OUTPUT DOWN
3. INPUTS ON EXTENDER CARD DOWN IN COINCIDENCE WITH DOWN INPUT ON CARD FOR UP OUTPUT
4. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN

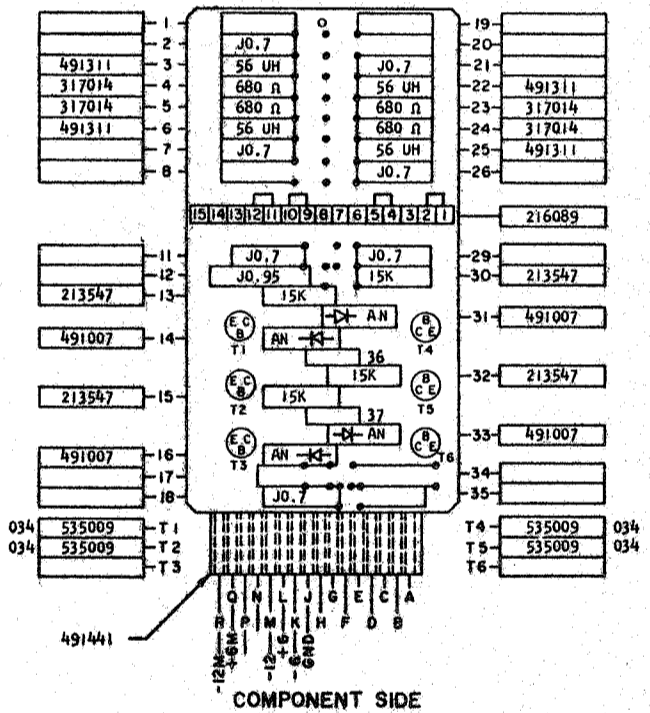
PINS	SIGNAL NAME	WAVE SHAPE	LEVELS		
			MIN	MAX	
E, F, H, D	T INPUT		UP	1.44	6.24
			DOWN	-0.74	-6.24
N, B	EXTENDER INPUT		UP	+6	
			DOWN	0.0	
G, C, P, A	U OUTPUT		UP	-0.54	0.24
			DOWN	-7.44	-12.5

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.10	0.80
TURN OFF	0.05	0.80*

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.

NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS. EXAMPLE: LOGIC BLOCK DRIVING EF "OR".



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

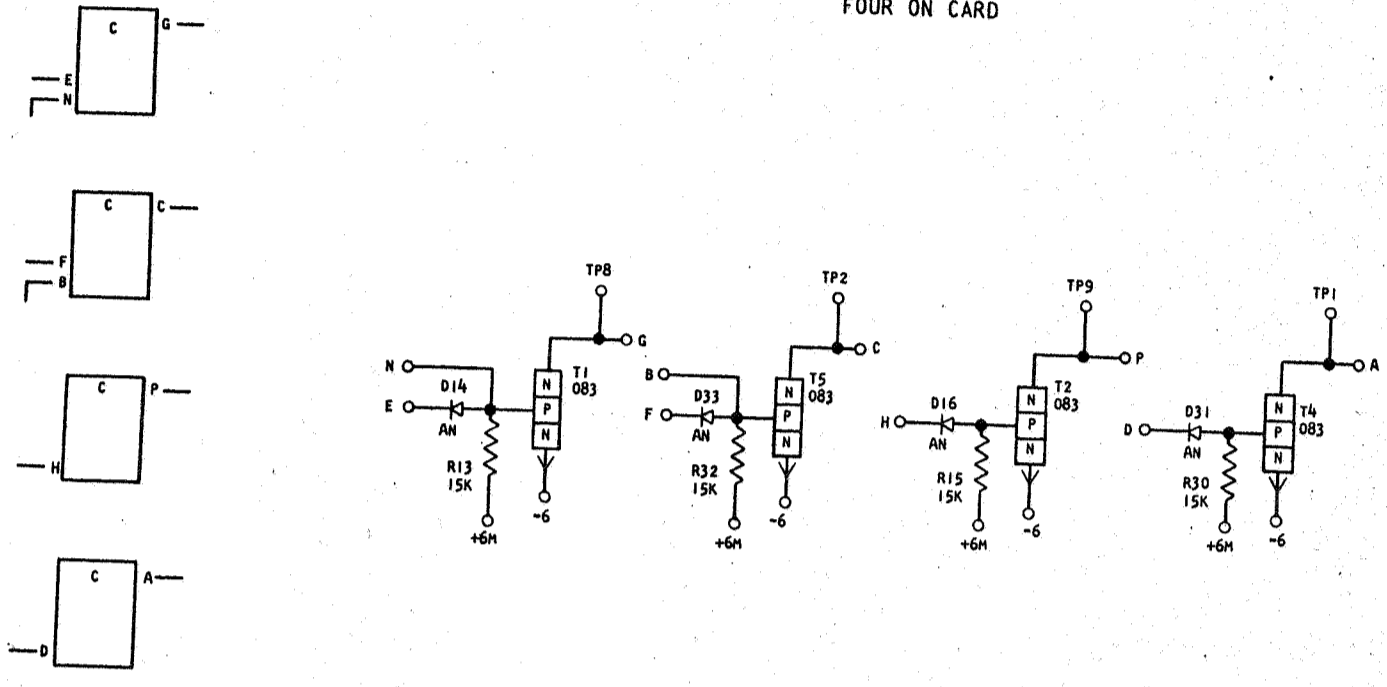
INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME TWIN CARD ASM - CTDL-ONE				4-1-62	115599					729848
WAY PNP 4 LBS-FOUR ON CARD										
DESIGN	RQ	3-1-62	MODEL SMS							
DETAIL	WH	3-1-62	SCALE NONE							
CHECK	WH	3-1-62	DRAW LIG 3-17-62							
APPRO			CHECK							

STANDARDS CODE
729849

CARD CODE 729849
CR --

REFERENCE DRAWING
SEE PRODUCTION DRAWING 371276

CTDL - ONE WAY NPN NO LOADS
FOUR ON CARD



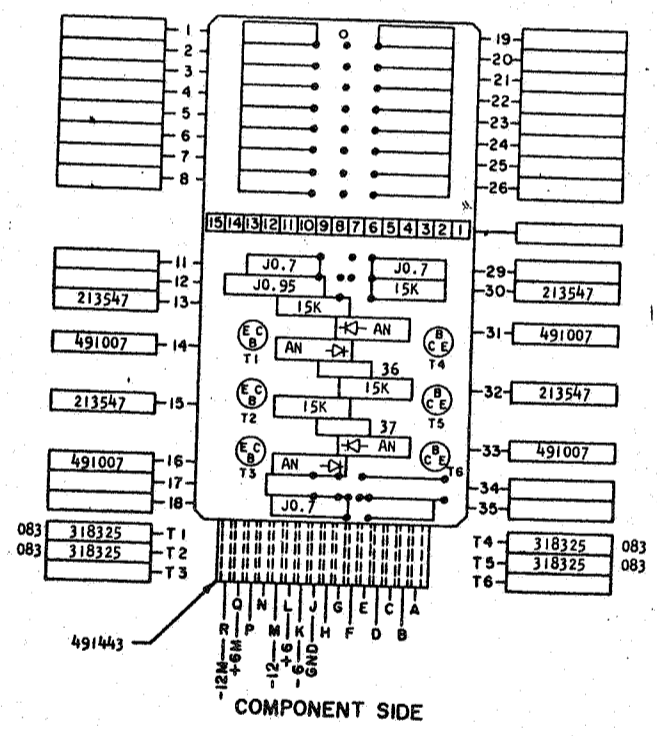
- SEQUENCE OF OPERATION
1. UP INPUT TRANSISTOR ON OUTPUT DOWN
 2. DOWN INPUT TRANSISTOR OFF OUTPUT UP
 3. INPUTS ON EXTENDER CARD UP IN COINCIDENCE WITH UP INPUT ON CARD FOR DOWN OUTPUT
 4. COLLECTORS MUST BE LOADED
 5. LOGIC BLOCKS MAY HAVE SYMBOLS OTHER THAN SHOWN

PINS	SIGNAL NAME	WAVE SHAPE	LEVELS	
			MIN	MAX
E, F, H, D	U	INPUT	UP	-5.26 0.24
			DOWN	-7.44 -12.5
N, B	EXTENDER INPUT	INPUT	UP	-6.
			DOWN	-12.
G, C, P, A	T	OUTPUT	UP	1.44 6.24
			DOWN	-5.46 -6.24

DELAY - USEC

	MINIMUM	MAXIMUM
TURN ON	0.05	0.70
TURN OFF	0.05	1.50*

*THIS DELAY CAN OCCUR ONLY ON HEAVILY LOADED BLOCKS.
NOTE: THE ABOVE RANGES OF DELAYS ARE REPRESENTATIVE. SPECIFIC CIRCUIT APPLICATION AND/OR WIRING CAPACITANCE MAY RESULT IN DELAYS WHICH ARE OUT OF THE GIVEN RANGES. IN SUCH CASES, CARD REPLACEMENT SHOULD INDICATE IF THE CIRCUIT IS OUT OF SPECIFICATIONS. EXAMPLE: LOGIC BLOCK DRIVING EF 'OR'.



CIRCUIT AND PACKAGING STANDARD	
APPROVAL	DATE
ABC	4-2-62

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	APPROVAL	DATE	CHANGE NO.	APPROVAL	DEVELOPMENT NO.
NAME	CARD ASM TSTR-CTDL-ONE	DATE	-62	CHANGE NO.	115599	APPROVAL		DATE		DEVELOPMENT NO.
DESIGN	WAY NPN NO LDS-FOUR ON CARD	MODEL	SMS							
DETAIL	RQ 3-1-62	SCALE	NONE							
CHECK	WH 3-1-62	DRAW	LIG 3-17-62							
APPRO		CHECK								

729849