RTTY Journal

JULY-AUGUST 1980

VOLUME 28 NO.6

75 CENTS

EXCLUSIVELY AMATEUR RADIOTELETYPE

WORLDS'YOUNGEST RTTYER ???

DAD,CAN I BORROW THE TELEPRINTER TONIGHT????? seems to be what Jeff,age 6, is saying. Jeff, son of Mike ,WBOQCD practices on the keyboard frequently and knows every function of an ST6 terminal.Jeff also has a working knowledge of Morse code but is somewhat hindered by the fact that he is just now learning to read....

CONTENTS

RTTY JOURNAL

Dee Crumpton
Editor & Publisher
P.O. Box RY
Cardiff by the Sea,
California 92007

THE RTTY JOURNAL IS PUBLISHED 10 TIMES PER YEAR. MAY-JUNE & JULY-AUGUST ARE COMBINED.

Second Class permit
Encinitas, CA 92024

Business Offices
1155 Arden Drive
Encinitas, CA 92024

POSTMASTER SEND FORM 3579 to Post Office Box 179 Cardiff, CA 92007

BACK ISSUES

A duplicate of any back issue may be obtained from R.Wilson, 4011 Clearview Drive, Cedar Falls, IA 50613.$1.00 PP. Reprints of all UART articles $2.00.

SUBSCRIPTION RATES

USA	$ 5.00	year
Canada	$ 6.50	"
Mexico	$ 6.50	"
Air Mail	$ 7.50	"
Foreign		
Surface	$ 8.50	"
Air Mail	$12.00	"

ALL IN USA FUNDS ONLY

SUBSCRIPTIONS AND ADS ARE CASH IN ADVANCE-NO BILLING

FOREIGN SUBSCRIPTION MANAGERS

CONTACT MANAGERS FOR RATES IN THEIR TERRITORIES

EUROPE

JEAN HURTAUD,F8XT
CHILLAC
16480 BROSSAC,FRANCE

AUSTRALIA

NORMAN WILSON,VK4NP
POB 81A ALBION,BRISBANE
QUEENSLAND,4010 AUSTRALIA

ENGLAND

DR. ARTHUR GEE,G2UK
21 ROMANY ROAD,OULTON BROAD
LOWESTOFT,SUFFOLK
NR32 3PJ, ENGLAND

JAPAN

TOSHIO HOTTA, JA2EFV
4-5-11 TOMIDA
YOKKAICHI CITY
JAPAN 512

"WORLD FRIENDSHIP THROUGH AMATEUR RADIO"

SEANARC '80

SEATTLE NATIONAL AMATEUR RADIO CONVENTION

26th NATIONAL ARRL CONVENTION

July 25 – 27, 1980

Seattle, Washington

ENJOY THE 26th NATIONAL ARRL CONVENTION IN THE BEAUTIFUL PACIFIC NORTHWEST

SEMINARS, DISPLAYS, LADIES PROGRAMS, FORUMS AND MAJOR EQUIPMENT EXHIBITORS WILL HIGHLIGHT THIS GATHERING AT THE SEA-TAC AIRPORT RED LION MOTOR INN.

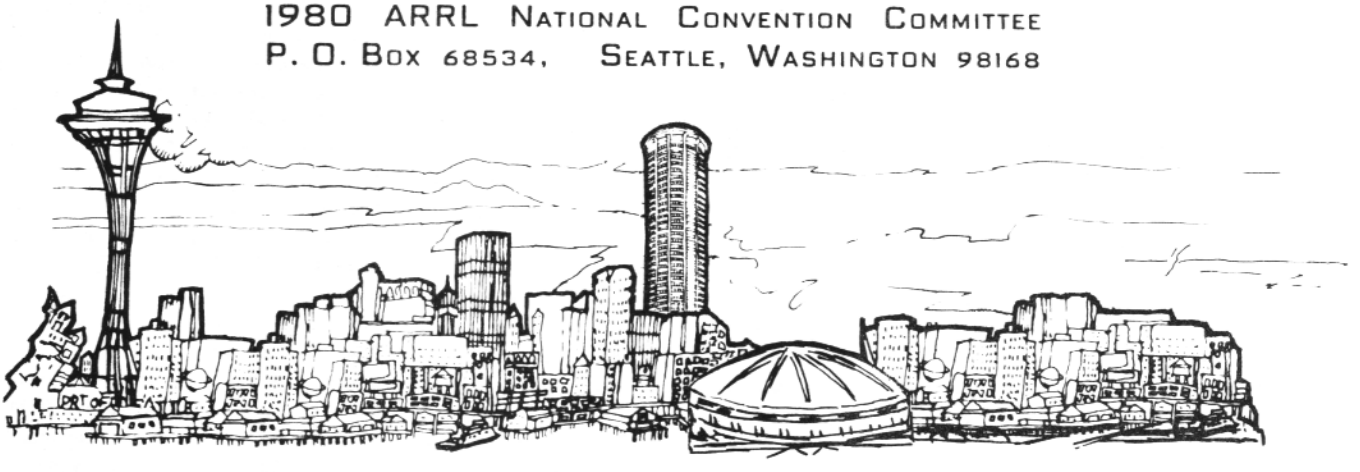
Roy Neal, K6DUE, of NBC News will be the featured Saturday night banquet speaker.

Vic Clark, W4KFC will explain the results of WARC-79 and what it means to the future of amateur radio.

Meet ARRL President Harry Dannals W2HD, and other ARRL officials.

For Program and Registration Materials Write:

1980 ARRL NATIONAL CONVENTION COMMITTEE
P. O. BOX 68534, SEATTLE, WASHINGTON 98168



HITS & MISSES

George Hammon WA6CQW
14215 Pecan Park Lane SP 73
El Cajon, CA 92021

FROM THE MAILBAG

TRS-80 M-80

Owners of the versatile TRS-80 with the M-80 interface and M-800 know the joy of operating RTTY with a system offering many advantages and great flexibility. It does however, produce some RFI in the Ham receiver since the TRS-80 keyboard/cables are not properly shielded.

First, you should read the March 1980 issue of QST for an excellent article on RFI and the TRS-80 and M-80. The following modifications should now be completed.

1. Enclose the M-80 in a shielded metal cabinet.
2. Bypass each side of the 12 v ac at the M-80 with 0.1 Mfd capacitors.
3. Use shielded cable from the M-80 to the keyboard.
4. Use shielded cable throughout:PTT, FSK (keep cables short).
5. Replace all radio shack cables with shielded cable.
6. Enclose the keyboard P/S in a metal cabinet and ground the PS.
7. Use line filters (See QST March 1980).
8. Remove all electronic components in the keyboard and spray the inside with tube-coat (Walso,Cesco) and attach a ground strap or mount the keyboard in a metal cabinet.

Many thanks to the west island Amateur Radio Club newsletter and VE2ESV for this information.

VE2ESV has completed up to step 4 and reduced the RFI by 80%. He also reports his biggest improvement was shielded cable to the TV receiver. He would like to hear from you concerning your experiences etc, concerning RFI,M-80 or RTTY operation.

APPLE NET

Amateurs owning the Apple computer should tune into the Apple computer net meeting on Sundays at 0100 on/about 14.329Mhz. Net control is Jim, WB7TRQ in Cheyenne, WY.Info from Alex AF6W.

BUS CHARTERS

I notice in reading about the Dayton Hamfest, many clubs banded together and made the trip by bus. I hope this idea will grow across the country. Summer is almost here and Amateur Conventions are in full bloom. I would like to start a "grass roots" campaign, getting Clubs to charter a bus when going to conventions,helping the energy crisis in the process. The idea of being let off at the convention door and picked up for the return trip home really appeals to me. I hope that your club will give this some thought.Additionally, parking at most conventions is at a premium. With charter buses or car pooling the Amateur can do his/her part to reduce gasoline consumption.

NCC 1980

The National Computer Conference was held in Anaheim,California on May 19-22. The cword was placed at about 80,000 with 600 vendors in 1,600 booths. The vast majority of the 100+ technical sessions focused on the usuability of computers as tools.

I stopped by the Apple computer booth and was treated to a look at the Apple III,which represents the high end of the company's product line. It is aimed at small to medium sized businesses. The CPU has been tagged the 6502A. The unit will cost from $4,340 to $7,800 depending upon configuration. It will be on display around June 1,1980.

The basic unit has 96K of memory and is expandable to 128K. The built-in disk drive and calculator style numeric pad are features of the Apple III. The built-in disk drive is DOS 3.3 and will increase the disk storage capacity from 116K to 143K. It will support three external disk drives without the need for additional hardware or software.

Apple has a new printer. The apple silentype thermal printer provides draft-quality text and graphic output on paper. Price $595.00 including the Apple interface card. This compact, versatile unit is portable and only weighs 6 lbs. The printer receives its power from the Apple computer and is compatible with both Apple II and III.

The convention center was filled necessitating booths being housed in the parking lot and minicomputers being displayed in the underground parking lot of Disneylands'hotel. A shuttle bus was provided at no charge A touch of class by the Apple Company was Apple night at Disneyland. Free ticketswith unlimited rides were given away by stopping at their booth.

RADCOM PLUS
NEW PRODUCT REVIEW

The last several months I have been in contact with Alex Massimo,AF6W about his new RTTY & CW system for the Apple computer. The system was developed by Alex and Dr. Chris Galfo, WB4JMD. This system installs in slot 2 of your Apple II or Apple II plus with interger basic. The card has gold plated contacts with a computer grade circuit board,plug in chips and dip relay with RS-232 FSK output.

The TU has active filters for narrow shift (170 Hz).The card in addition to a TU has LED tuning for RTTY CW and RTTY scope monitoring points. It comes assembled and tested and includes RTTY and Morse code interfaces Software features Baudot speeds continuous from 3Z to 300 Baud,ASCII speeds continous to 1200 Baud and Morse code speeds 2 to 125 WPM. The picture gang can store pictures on the disk and transmit them without the mess and storage problems of paper tape. On long pictures the unit will CW ID without returning to receive as the picture runs. A repeat of your entire last transmission is also provided the auto transmit, receive escape key control (PTT) allows the operator to answer a BK question even with the buffer loaded with your next transmission.

The contest buff will really like the provision to log all contacts to the disk. This means your signal report, message # etc. received and transmitted,all will be logged to the disk and free you to work more contacts faster and do away with all of that logbook work.

The average operator or newcomer will find, on screen CW and RTTY tuning indicators, live keyboard to prepare text while receiving, auto

RTTY-DX

SKIP PRINSEN WB6CYA

3611 Merrimac, San Diego, Calif. 92117

714-276-3182

Greetings to all!

The bands sure have been having their ups and downs of late. When the bands have been good many DX stations have been reported active.

Several countries have not been added to the ARRL countries list as of now.T4 was officially assigned to Cuba so there is some question on that one. H5 is under consideration at the present time so anyone receiving info on these countries or any other country being accepted by the committee please let me as soon as possible.

Sis,5NOsid was at Dayton again this year. He returned carrying much gear, including a complete TR7 station and complete 2 meter repeater system to set up in Lagos,Nigeria. Bud,W2LFL was his host while he was in the US.

Other RTTYersat Dayton:5NODOG,9Y4VU Xe1LL and AH6D.

I have received only one input from the comments on the use of ASCII. Jim MCAdams of Huntsville,Alabama writes that he would like to see ASCII good above 14,100 and correspondingly on other highbands, and above 3640 on 80 meters. I know that I have tried to tune in 5 level,or what I thought to be 5 level only to find that I could not make head nor tails from the transmission. I ttt, would hope that stations using ASCII would get together say at 14,100 and go up the band.

Here is a partial listing of active stations and the QSL info for some of them:5H3KS,Karl POB 250,DAR-ES-Sallam,Tanzania;ZP5CCG,Pedro;ZP5CPE, Gil;K65AD/KH2,Ken;5NOSID,Sid;5NOaas; 5NODOG;FR7AT,FR7BE,Gene QSL via W4LZZ EA9FJ;EA9GE;EA9HR;S8AAR;S8AAM;VKOKH, Antartica,GW3EHN;GM4HPO;GM4BIT;GI4AHD GI4JER;GI4ZKT;DK5BD/ST2 QSL DF1BP Walter Hahn,Bransted STR2,D2808,Syke, F.R.G;ZS2MI QSL via WA2IZN;GJ3FKW; 9A1ONU QSL via IOLVA;5T5JD,Hose on 50 baud;P29BB QSL via VK4AHD;TR8JG POB 665,Port Gentil,Garbon;Y38XD; PZ1BF;HL9UN QSL via KA6B formerly WB-6TZQ;ON5CK;ON4CJ;ON7AZ;ON7OT;ON7EP; LA5JS;LA3WH;3D2BM, Bernie soon to QSY to Trinidad 9Y4; LZ1PG;LX1MG;LX1MH; TF3UA;TF3IRA;UK2BAB;UA3AHM;FP8DG;ND4-AI (ex KP4);N4AZB/KP4;CE3CBG;CE3CEW; CP3EE;CT1EM;YO2IS;YO3KPA;OA4BR,Zip Zellon,Box 538,Lima,Peru;9G1JX;OX3FG; EA5QW;EA3UU;EA7DD;EA4ER;EA5IO;EA5ASA; EA3AVG;EA8GF;EA8IY;TR8PC,Claude;HP1-XUL;VP2AW,Antigua Dorothy using TRS-80,M80,M800;C6ACA,Bahamas usually QRV Saturdays 22-2400Z;HK3SB;YV3BIA;YV3-AAG;YV5GU;TG9GI;TI2XG;TI2CAH;KA6ZC.

Many thanks to the following for their inputs:W3KV;W2LFL;JA1DSI;K1LPS; WB6ZHN;W2PSU;W6KMI;VK2SG and WOHAH. Again many thanks to those who have given their time and efforts to help make these inputs what they are.

73 de SKIP

AWARDS SECTION

Worked all continents all on 20 meters #84 dated 18-4-80.Special award using ONLY 1 watt goes to "Bud" Smith W2LFL.

Worked all continents all on 20 meters #85 dated 18-4-80 to VE7BTO,Jack Wiebe.

DXCC 160 endorsement goes to W2LFL. Bud has now worked 162 countries and confirmed 160 countries.

DXCC 180 endorsement to ON4BX,Arthur Blave,Arthur has worked 191/185 confirmed contacts all on RTTY and is number one on the DXCC Honor Roll and holds the RTTY JOURNAL DXCC Award Number one.

HAM HELPS

Tim James,J6LT,POB 1026,Castries, Saint Lucia,writes that he is looking to get started in RTTY. He wants to be able to have hard copy so that he can also copy the new services. Can Anyone help him?? Thanks.....

DXCC HONOR ROLL

ON4BX-191/185;ON4CK-184/181;W3KV-182/178;W3DJZ-172/168;K7BV-177/167;I5WT-161/161;W2LFL-165/160;I8AA-154/152; W5EUN-156/151;W4CWI-153/146;W8JIN-134/129;F8XT-143/128;K6WZ-136/126;F5JA-132/123;JA8ADQ-125/120;W3EKT-125/118; DJ8BT-111/106;K3SWZ-110/105;W7MI-110/101;W2IUC-100/100;JA1DSI-108/95;VK2SG 109/94;W2PSU-105/93;K4VDM-93/88;WA6-WGL-102/85;WB6CYA-92/82;WOHAH-88/81; DK5WJ-101/76;WONT-79/73;W8CAT-66/59; WB2VTD-67/57;DF7FB-65/53;K1LPS-65/51; WA6CQW-50/49-W85QBV-55/42;WA4LLY-38/11;WA2ZKZ-36/12.

VK/ZL/OCEANIA 1980 RTTY DX CONTEST

DATE:14-15 June 1980

TIMES:1. 0002-0800Z Saturday 14th.
2.1600Z-2400Z Saturday 14th.
3.0800Z-1600Z Sunday 15th June.

THREE CLASSES: A. Single operator. B.Multi-operator C. SWL operators. Number exchange: Serial # will consis of RST,Zone # and GMT. Scoring as per CARTG Zone chart,multiplied by the # of continents worked. After this world stations add 100 points for each VK/ZL worked on 14 MHZ,200points for each VK/ZL worked on 21 Mhz, and 300 points for each VK/ZL sta. worked on 28 Mhz. A station may be worked only once on each band but may be worked on all three bands.

COUNTRIES: ARRL Countries,except that each VK,ZL,JA,VE,VO,W/K districts count as separate countries.

LOGS: Must show in this order: date, GMT, Call sign of station worked, serial # sent,serial number received, points.

CLOSING DATE: Logs must be received by the contest committee by 1-Sept. 1980. Mail to: W.J.Storer,55 Prince Charles Rd, Frenchs Forest 2086,NSW, Australia.

SUMMARY SHEET: MUst show call sign of station,name of operator/s address of same,bands used (separate log for each band),points claimed for each band,# of VK/ZL stations worked, total points claimed and signatures. Multi-operator station logs must contain signature and call of each operatro.

AWARDS:Issued for 1st,2nd and 3rd on a world-wide basis and also on a country basis. The judges decision regarding placings in this contest will be final-logs become property of the committee. This contest is sponsored by the Australian National Amateur Radio Teleprinter Society,POB 860,Crows Nest,NSW,australia..

KONTEST KORNER

CARTG	October 80	coming
WAEDC	November 80	coming

SEANARC '80

26th NATIONAL ARRL CONVENTION

JULY 25-27, 1980

SEATTLE, WASHINGTON

THE SCANDINAVIAN AMATEUR RADIO TELEPRINTER GROUP 9TH WORLD WIDE CONTEST 1979.

SINGLE OPERATOR TOP FIVE

CLASS A

I3FUE	408,120
W3EKT	295,800
SM6ASD	262,500
IT9ZWS	258,500
DJ6JC	258,240

MULTI OPERATOR TOP FIVE

CLASS B

I5MYL	341,040
LZ2KRR	189,240
UK4FAD	182,115
G3UUP	176,175
DM3GM	156,375

SHORT WAVE LISTENERS

CLASS C

G8IZD	209,475
DM-7481/B	180,225
DL-005-169485	142,740
16-10977	134,400
DL-A36/158337	96,205

CLASS A SINGLE OPERATORS

6. K8NN	223,975
7.I2OLW	210,105
8.I7FKO	205,755
9.I2WEG	193,800
10.I2DMI	188,700
11.G3ZWW	182,500
12.W7DPW	145,530
13.W4CQI	139,995
14.I2ZGP	101,075
15.3A2GX	93,515
16.JA3AHQ	93,380
17.WA2OQO	90,475
18.OZ9JB	86,125
19.VE4BF	86,060
20.EA3AZX	81,715
21.ON7AZ	76,000
22.DE7DTA	73,990
23.ZS6AKO	72,820
24.VE2AXO	72,090
25.OZ8GA	72,020
26.SM6AEN	70,225
27.VE2QO	59,500
28.OZ2X	55,380
29.YO2IS	52,735
30.LA7AJ	50,150
31.G3RDG	49,750
32.I1TXD	47,840
33.WA6CQW	46,690
34.VK2PG	42,480
35.HB9AVK	40,890
36.ISOESS	40,425
37.DM6AK	39,950
38.JA1DSI	39,400
39.W3FV	37,440
40.VK2EG	33,950
41.JA1DI	32,470
42.7P8BC	31,800
43.W6IWO	30,975
44.IV3PVD	30,400
45.DF7FB	29,820
46.G3GGL	27,550
47.DM2DLE	27,060
48.OZ7XE	26,775
49.JE2JWK	24,840
50.DJ1KF	21,235
51.VK5WV	20,550
52.K6WZ	19,530
53.W4YZ	17,710
54.DL6WZ	14,040
55.VE7DOC	13,200
56.GW3EHN	12,875
57.DF6ZY	12,600
58.SM7BGE	12,480
59.W3KV	10,680
60.W3JF	9,900
61.EA4XW	9,240
62.DL2QB	8,840
63.OH2MD	8,820
64.DJ2YE	8,280
65.OH7UV	7,920
66.DJ3OE	7,370
67.JR2TZL	7,125
68.LA8SA	6,825
69.VE2GV	6,545
70.DM2FDO	5,940
71.SM5AAY	5,250
72.DM3QK/DM3RKK	4,680
73.JA1EUL	4,060
74.DJ1XT	3,900
75.K8UFW	3,315
76.SM6CAL	3,080
77.SM7BBJ	1,520
78.TF3UA	1,500
79.VK2EL	1,485
80.F6BVB	1,050
81.OZ3UL	780
82.PJ3SF	770
83.SM4CJY	760
84.DM2BYF	690
85.W8TCO	960

CLASS B MULTI OPERATOR

6.OH2ZY	151,620
7.SK6AW	115,940
8.TF3IRA	90,990
9.K5ZCH	79,195
10.KF4W/K84HF	72,240
11.DM3BB	54,855
12.LZ1KDP	48,475
13.DM5YI/P	26,790
14.OZ8JYL	22,240
15.HA6KVD	20,410
16.DM3CF	7,350

S.W.L's

6.DM-2814/M	90,240
7.DL-22438	86,310
8.OK1-20677	65,520
9.G8CDW	49,140
10.DE-GL01669613	24,975
11.OK2-21478	550

Many thanks to the follw ing for their check logs: DM2CNE,W8GKW,MD6AF/DM2CDF DF2AT,OZ4IJ.....

10th S.A.R.T.G CONTEST

RULES:

TEST PERIODS:

1.0000-0800GMT SAT.AUG16
2.1600-2400GMT SAT.AUG16
3.0800-1600GMT SUN.AUG17

BANDS:

Use all bands 3,5-7-14-21-28 Mhz.

CLASSES:

A.Single Operator
B.Multi-Operator,single transmitter.NOTE: Logs from Multi-operators must contain the names and call-signs of all operators involved.
C.SWL's

EXCHANGE:

RST and QSO nr.

POINTS:

QSO with own country five (5) point.Other country in same continent ten(10) points.Other continent fifteen (15) points. In USA,Canada and Australia each call-district will be considered a seperate country. The same station may be worked once on each band for qso and multiplier credits.Only 2-way RTTY QSO's will count.

MULTIPLIERS:

Use the DXCC list and each district in W/K,VE/VO and VK.NOTE:Contact with a station which would count as a multiplier must be found in at least 5 logs,or contest log from the multiplier station must be received in order to be valid.

SCORING:

Sum of QSO points X sum of multipliers.

SWL's:

Use the same rules for scoring but based on stations and messages copied.

LOGS:

Logs must be received by October 10th 1980.The logs to contain: band, date, time GMT, Callsign, exchanges sent and received, points and multipliers. Use a separate sheet for each band and enclose a summary sheet showing the scoring,classification,callsign,name and address, and in the case of multiple operator station the names and call-signs of all operators involved. Comments will be very much appreciated. Send your log to:S.A.R.T.G Contest & Award Manager,P.O.Box 717,DK 8600 Silkeborg,Denmark.

AWARDS:

To the top stations in each class,country,W/K,VE/VO and VK call district.

RY, Fox and CQ messages,auto carriage return and line feed are also included. The software features of this unit are endless. The few I mentioned in this report are to expose you to how meticulous Alex and Dr. Chris have put together value-packed unit. The cost of this unit assembled and tested is $190.00,shipped prepaid in the USA,all others add $10.00.

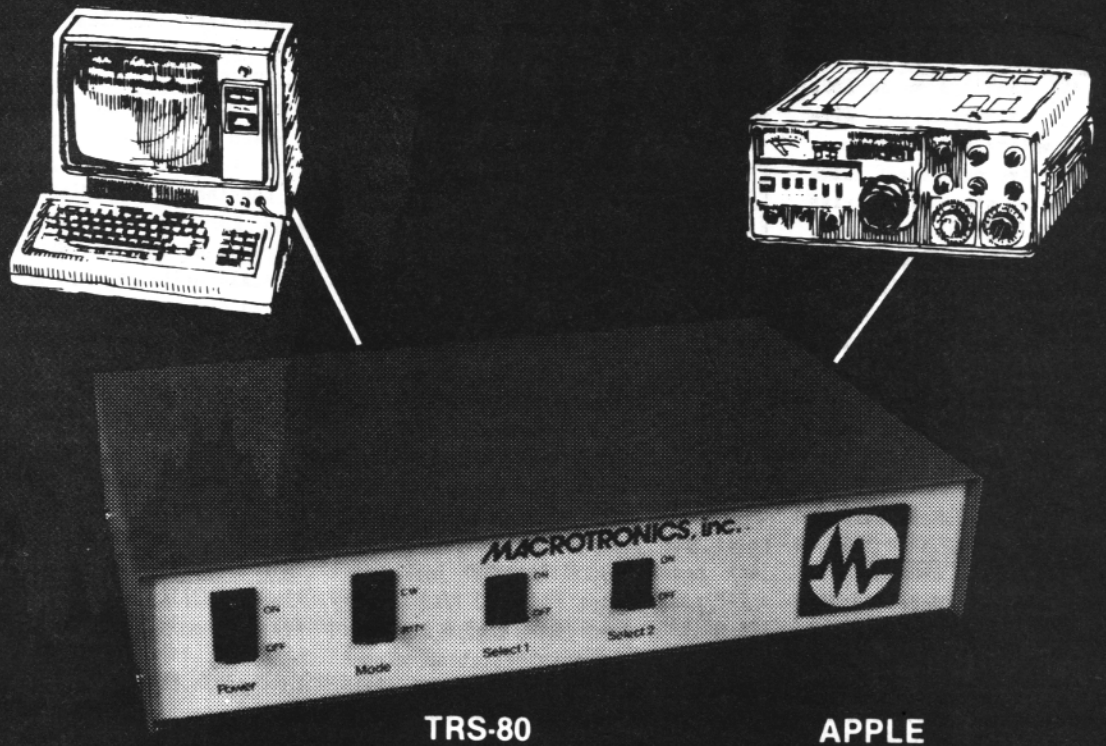
Apple owners getting started in RTTY might consider this unit. I call it instant RTTY. The unit comes with an 8 page instruction manual which documents all of the versatile features of this unit.

I was unable to get information on terminal units and how to get everything hooked up into this column due to a tight printing schedule. Next month I shall devote a large part of my column to this subject. The newcomer can gain valuable information by ordering the "RTTY BEGINNERS HAND BOOK" from the JOURNAL,POB RY,Cardiff CA 92007 cost $4.50.

So long for now,

George WA6CQW

TRS-80, PET, APPLE, SORCERER
Ham Interface Systems



TRS-80

☐ **CM80** Send/Receive CW & RTTY in cabinet as illustrated **$279**

☐ **M80** as above less cabinet **$149**

☐ **M800** adds advanced RTTY (split screen) to CM80/M80 **$99**

PET

☐ **M650** Advanced RTTY (split screen) & CW in cabinet as illustrated **$210**

☐ **M65** Send/Receive RTTY & CW (cabinet **not** included **$129**

APPLE

☐ **A650** Advanced RTTY (split screen) in cabinet as illustrated **$210**

*Advanced CW(split screen) available soon!

SORCERER

☐ **CS80** Send/Receive CW & RTTY in cabinet as illustrated **$279**

☐ **S80** As above less cabinet **$149**

Write or call for complete catalog

MACROTRONICS, inc.®

1125 N. Golden State Blvd. / Suite G
Turlock, CA 95380 (R)
(209) 667-2888 / 634-8888

master charge VISA

California residents add 6% tax

We are experiencing telephone difficulties, please keep trying.

Classified Ads

30 WORDS $2.00 ADDITIONAL WORDS 4¢ EACH -CASH WITH COPY-DEADLINE 1ST OF MONTH FOR FOLLOWING MONTH.

SELL:HAL DS2000,HAL 9 INCH Monitor,3 months old, mint $430-now have DS3100 Shaw,N6CG, RFD, Bolinas, CA 94924.

CASSETTES WHOLESALE! Computer grade in packs of 10,25,50 and 100. Same tape used in all MICRO-80 Software. LIMITED OFFER,Only 99¢ each.Add $1.50 postage & handling.Write Micro-80 inc Wholesale Division,R-2665 N.Busby Rd. Oak Harbor,Washington 98277.

FOR SALE:33 ASR ($350);3 speed 28RO ($225);Model 19 ($150);28 KSR with sproket feed complete but needs work ($100);model 14 typing reperf with keyboard (50);very nice DT600 with AFSK in cabinet (150) All above plus shipping. Bill Davis,WOMZN,507-452-3468 after 7PM,RR3,Box 241,Winona,MN 55987.

GOING COMPUTER:FOR SALE HAL-ST-6 $250 Dovetron TBA-1000 Baudot-ASCII interface $200.XITEX-MRS-100-Morse transciever $125.HAL RVD 1005 Vidio converter $200.4-M28 stand alone TD's $100 each.M28 stand alone 60-75-100 WPM reperf $125."Doc",W5FJU,Houston, TX. 713-774-6625.

HAL ST-6 TERMINAL UNIT 850 and 170 shift $200 plus shipping.Model 28 Miniatur TD (LXD) includes 60 and 100 WPM gears $100 plus shipping. Bud Herring,POB 426,Weaverville,CA 96093, Phone (916) 623-4371.

TELETYPE EQUIPMENT AND SUPPLIES.MODEL 28 RO $125,28 ASR $350,ROTR (60-75-100)$150,28 TD (LXD) $100,New roll paper (12/case) #21 (4½ diameter),$25 (5 diameter). Ribbons $10/doz. FOB Rochester.1980 list now available,SASE.P.Andersen,115 Boyhen Rd,Rochester MI,48063.313/652-3060.

NEWS-NEWS-NEWS-AMATEUR RADIO'S NEWS paper,"WORLDRADIO",Trial subscription Two issues for one dollar."WORLDRADIO 2509-F Donner Way,Sacramento,CA 95818

TELETYPE & ALLIED MACHINES & ACCESsories.SASE for list. 20% off on all pick-ups.10% off on all shipments. B.Goodman 5454 S.Shore,Chicago,IL

COLLECTOR BUYING TELEGRAPH & ALLIED instruments of yesteryear. R.Eichner, 914A Oakcrest,Charleston,IL 61920.

RM-300 THE COMPLETE TU AND AFSK generator on one board.Your CW ID generated from on board PROM.Thinking of VHF RTTY through your local repeater? This premium quality is ideal. Complete documentation $2.00.RM-300Board just $21.25. Complete kit (less PROM) $71.25.Prom programmed with your call $7.00.RP-400 power supply (+5v & -12v and dual loop supply)board only $21. 25.Complete kit with heavy duty transformer and solid state auto start relay $71.25. Cal residents all 6%. Postage and handling $1.00. ECLIPSE COMMUNICATIONS, 5 Westwood Dr., San Rafael,CA 94901.

SALE:FRESH,HEAVILY INKED UPI RIBBONS, fits all teletype machines $6.95 doz; Red & black ribbons dual spool $16.50 doz;Kleinschmidt ribbons $11.50 doz; perforator tape 11/16" x 8" case of 40 rolls $19.50;perforator tape 1" x 8" pink,case of 28 rolls $19.50; perforator tape 1" x 8" black,case 28 rolls $19.50'narrow strip printer tape 3/8" wide ungummed,box of 25 rolls $8.90;case of 100 rolls $23.50; jack panel containing 100 jacks on a 24" panel,takes standard 1/4" plugs $28.00;88MH toroids pack of 5 for $3. model 28 self contained,stand alone typing reperf with 3 speed gear shift $135.00;single speed $99.00;model 28 ASR keyboard (less motor and perf) $49; model 28 LAXD TD head $55;Model 28 LARP multi magnet reperf complete with motor,base and mounting studs to fit inside model 28 ASR cabinet $195;Model 14,15 SYN motors,1800 rpm $19.50;Model 14 typing reperf (less base and cover) $29.00;also available paper,gears,manuals,parts,and complete model 14 through 35 machines. Send us a list of your teletype requirements.All prices FOB Brooklyn,NY Atlantic Surplus Sales,3730 Nautilus Ave.,Brooklyn,N.Y. 11224 Tel:212-372-0349.

WANTED:TELETYPEWRITER PARTS AND Assemblies for Teletype,Kleinschmidt and Mite Corporation machines. Phil, WA4LNW, POB 70,Morrisonville,NY 12962

I PAY CASH-KLEINSCHMIDT Model TT-98 & TT-76. Call Dave collect (213) 760-1000.

IF-2 SELCAL-WRU PRINTED CIRCUIT BOARD $15.00 (73 Magazine,p 254 Nov.78). Contains all circuits to control TTY and transmitter. Programmable to any access code in minutes.Easily interfaced to any station.Connects to UT-4 (UART),or IF-1 Regenerative Repeater PCB $12.00.Complete documentation Commercially fabricated boards also. R.Parry,38 W 255 Deerpath Rd,Batavia, IL 60510.

MODEL 33 RO'S LESS STAND AS IS.USED/ checked on line prior to shipment $250 total,shipped prepaid,anywhere in continental USA.With stand $265.00 W/RS 232 installed $300 while they last.Please specify 20 or 60 MA service.All units checked for major (visible) wear. Model 33 manuals $20 per set volume 1,2 and parts.Paper $30 per case of 12 rolls.Ribbons $17 per box,one doz.Please send certified check or money order.Many supplies and various terminals as is and rebuilt.Parts also available.Please write or call for lists.Tom Marriott, TRAM TELETYPEWRITER SERVICE,58 E,Elm Central Islip,NY 11722.516-582-9787.

TELETYPEWRITER GEARS,PARTS,RIBBONS, tools,manuals,supplies,also toriods. List,SASE,TYPETRONICS,Box 8873,Ft. Lauderdale,FL 33310.Cash or trade for unused repair parts,components,Klystrous,and military connectors.

KITS AND PARTS FOR THE RTTY AMATEUR, featuring the famous MEG-1 Demodulator,ID-1 CW ID'er and IPT-1 interface power supply and timer.These units available as kits,or fully assembled, plus a wide selection of quality new components,make the MIDNIGHT ENGINEERING GROUP well worth checking out. And don't forget our carbide drill bits,now more sizes available. Send 15¢ stamp for catalogue.Midnight Engineering Group,PO Box 349,Galesburg IL 61401

FOR SALE:RTTY DEMODULATOR,DESIGNED especially for the reception of short wave RTTY signals with various types of speeds and shifts.The PLL circuit is adapted automatically to the shift of the station received! Printing usual stations like press,military,amateur,diplo,weather,aeronautical,telex maritime,etc.is rather easy with this

RTTY Journal
VHF RTTY NEWS

Mike Stone, WBØQCD
P.O. Box H, Lowden, Iowa 52255

I enjoyed meeting many of you at Dayton this year. The Hamvention was, as usual, well organized and run. Specialized communications were certainly well represented (except for RTTY). Looking forward to next year!

A new repeater located at Ackley,IA (Waterloo area) is now operating under the direction of WBOQDV,Dennis Matura of Applington,Iowa. Frequency is 146.10/70 Mhz. and is RTTY regenerative. Send two spaces and the abbreviation "XMIT" to bring it up. It has no mark tone tail and is difficult to determine whether or not you are in the system. The repeater will stay open for 1 minute after processing the last RTTY signal. Then the two-space "XMIT" sequence must be followed again. This repeater for teletype use makes nearly 70 in the USA! VHF RTTYers in the Des Moines area are anxiously awaiting a new 146.10/70 RTTY repeater in Newton,I . This makes a total of 4 RTTY RPTS in Iowa with WB9OTW/RPT in FT.Madison area (Jim Garrison) running a combination voice/RTTY RPT. as well as a new "specialized communications" repeater located in the Quad-City area, WOYMW/RPT (Mike Hunt) at 146.03/.63 Mhz featuring RTTY/ASCII/SSTV/Phone and linked with a 439.25 Mhz.ATV repeater sponsored by the Iowa ATV Society. Not bad for cornfield state.

Got a nice newsletter from the Virginia Teletype Society,WB4JBJ/R at 147.705/105 Mhz.They are anxious to get going on VHF ASCII and 34 active stations. The VTS Teletype Net meets every Monday evening at 8 PM on the repeater. 220 Mhz RTTY? You bet says Lee McDaniel,WB4QOJ in the North Carolina News. The 220 repeater in the Winston-Salem area has extended coverage into Greensboro since the North Carolina Radio Amateur Tele type Society put up a new Station Master antenna. There are 25 stations on RTTY at 223.10/224.70 Mhz.WA4GIC/R CARRS RTTY Group reports in "Line Feed" that with the final approval of ASCII on the VHF bands, they are installingan Itel 80/20 Microcomputer system in the WB9WIC/R 144.71/145.31 Mhz to support ASCII users. ASCII space will be 1070 hz. and 1270 Hz mark so to not interfere with the established Baudot tones. KOVKH,Dick in Rapid City,S.D. verifies my reports of little regular use of ASCII so far on the HF bands. It appears that as warned many years ago,the extra levels of code in the ASCII information exchange along with the higher baud rates, do not provide as reliable copy as the standard Baudot 5-level code. Most who using the ASCII code on 20 meters,are only experiminting and using Baudot as the communications mode. Perhaps others have found better results? Send reports on ASCII activity in the VHF bands and how Baudot/ASCII systems are working out. The AMRAD NEWSLETTER in April reported a very successful ASCII Night QSO Party held on the first day of authorization at 0001 EST March 17th. The following stations sucessfully carried on,perhaps, the first two-way QSO in the country on ASCII:W4RI,WB4APR,WB4JFI,WB3ETS, WB4NFB,K5ZUV,W3ERG,W4ISM,K4CLP,W4CQI, WD4PAC,K4JUM,WA3MEZ,WB4MAE,W3HCF,W3-HCF,W3IJG,WA3LAW and WOLMD. Congratulations!

Special announcement of a planned "specialized communications" meeting for RTTY/ASCII/SSTV/FAX/FSTV buffs at the Sept.Peoria IL Superfest. Forums will be held with live demonstrations of all modes including a KB9FO Fast Scan TV "Fly-By' in his Cessna 150 aircraft! Don Miller,W9NTP will show his latest improvements in Color SSTV and Medium Scan TV. WB9UCW,Ron, will demonstrate the art of the "Rubber-band Model 15 printer!" Plan on making it....

See you, Mike

ADS CONTINUED

LED-controlled unit. Features:switchable audio filter;autostart relay;power supply 220 V AC 50 Hz;outputs: loop supply for mechanical RTTY machine,and/or TTL-compatible for VDU. Price,including packing and surface mail postage to anywhere in the world DM 420.00 or $240.Some more information is airmailed to you for DM 5.00 or $3.00,this amount is credited on the final price of the unit if ordered later on.Joerg Klingenfuss,Panoramastrasse 81,Hagelloch,D-7400 Tuebingen 7,West Germany.

COMMSOFT BRINGS YOU RTTY89 for the Heath H89 or H8/H17/H19 computer.Version 3.0 of the W6LLO program provides exclusive 3-level split screen; disk-based autostart (record incoming outgoing data on disk);disk load into pretype buffer;sophisticated on-screen graphics displaying complete system status including time;operation on Baudot or ASCII;plus much more. Write for descriptive brochure. Disk plus extensive user's manual $100 PPD (California residents add sales tax.) COMMSOFT,665 Maybell Ave.,Palo Alto, CA 94306.

FOR SALE: 4TH EDITION OF THE "LIST OF RTTY STATIONS IN FREQUENCY ORDER", now contains more than 2800 frequencies of commercial stations like press,aeronautical,weather,telex,military,diplo,maritime,etc,on shortwave Schedules of around 100 news agency stations are also included.This offset printed list is airmailed to you for $15.00 or 39IRC from Joerg Klingenfuss,Panoramastrasse 81,Hagelloch, D-7400 Tuebingen 7,West Germany.

6800*ACCURACY* 6502-HUEY Calculator program for your micro,high accuracy (47-bit arithmetic,calculate beam headings to eight significant figures in decimal!)trig functions,RPN stack (X,Y,Z,T),scientific notation,number size to 10E37,extra internal memories capability to add your own functions (requires manual) complete floating point math package,all in 2.5K bytes. Hex dump and instructions $10.00,manual with commented assembly listing $25.00 (specify 6800 or 6502)Tapes and disks also available-write.WA4OSR Mitch,c/o THE BIT STOP,Box 973-J,Mobile,AL 36601,phone 205-342-1653.

SEANARC '80 July 25-27,1980-Seattle.. BE THERE! WE WILL....

microcomputing

In my last column I described a general purpose amateur radio microcomputer application.

This month I would like to discuss how you can get started in home computing. Obtaining a home computer is like buying any expensive home appliance. The best way to learn about them is to read articles,books,and talk with others. Computer Clubs are active throughout the world,attend some meetings and ask questions.Don't forget home computing can be quite expensive. Research the subject well, and don't jump too fast, you may be sorry later.

Let's explore, in a general manner, the types of home computers currently available. They primarily fall into three groups:

1. Single Board Computers with limited expansion capability.
2. Packaged Systems with a bus structure and good expansion capabilities.
3. Home Brew Systems with a bus structure and unlimited expansion capabilities.

A few samples of each type of system are:

1. Single Board Systems-Pet,TRS-80, Apple etc.
2. Packaged Bus Systems-OSI, North Star,SWTP, Midwest Scientific.
3. Home Brew Systems-S100 or SS50 bus cards purchased from one of hundreds of manufactures.

You may have noted that I stressed the word expansion in all my descriptions. Expansion means that you can add hardware features to your system to do new and different things like play music,memory or even allow the system to speak. You will find that home computers always grow in size. (Murphy's law).

I also threw out another term called a bus. A bus is nothing more than a number of connectors mounted on a printed circuit board with all equivalent pins connected together. Each pin on the connector has a name and a defination for the signal applied to that pin. The most popular home computer busses are IEEE S 100 (100 pins) and the SS50 (50 Pins).

Cards can be plugged into the bus to serve various functions. Let's explore some of the advantages and disadvantages of each system as follows:

1. Single Board Computers-
   Reasonable initial cost
   Expansion limited and costly
   Software easy to obtain on some systems.
   Not suitable for all ham radio applications.
   Poor and limited documentation.
   RF & TVI prevalent on some systems
   Can be obsolete easily with technology advances.
2. Packaged Bus Systems (assambled or kits.
   Higher initial cost.
   Expandable due to bus structure of system.
   Software available from manufacturer and other sources.
   Suitable for all ham applications.
   Good documentation.
   Easy to modify and expand.
   Can be upgraded as technology advances.
3. Home Brew Bus Systems
   Lowest initial cost.
   Can be expanded at low costs.
   Wide distribution of software in clubs.
   Best way to go for ham applications
   Never obsolete can expand as technology advances.
   Sometimes difficult to get operational.

Once you have selected a possible system, The availability of software should be investigated since this topic requires considerable discussion. This topic in my next column.

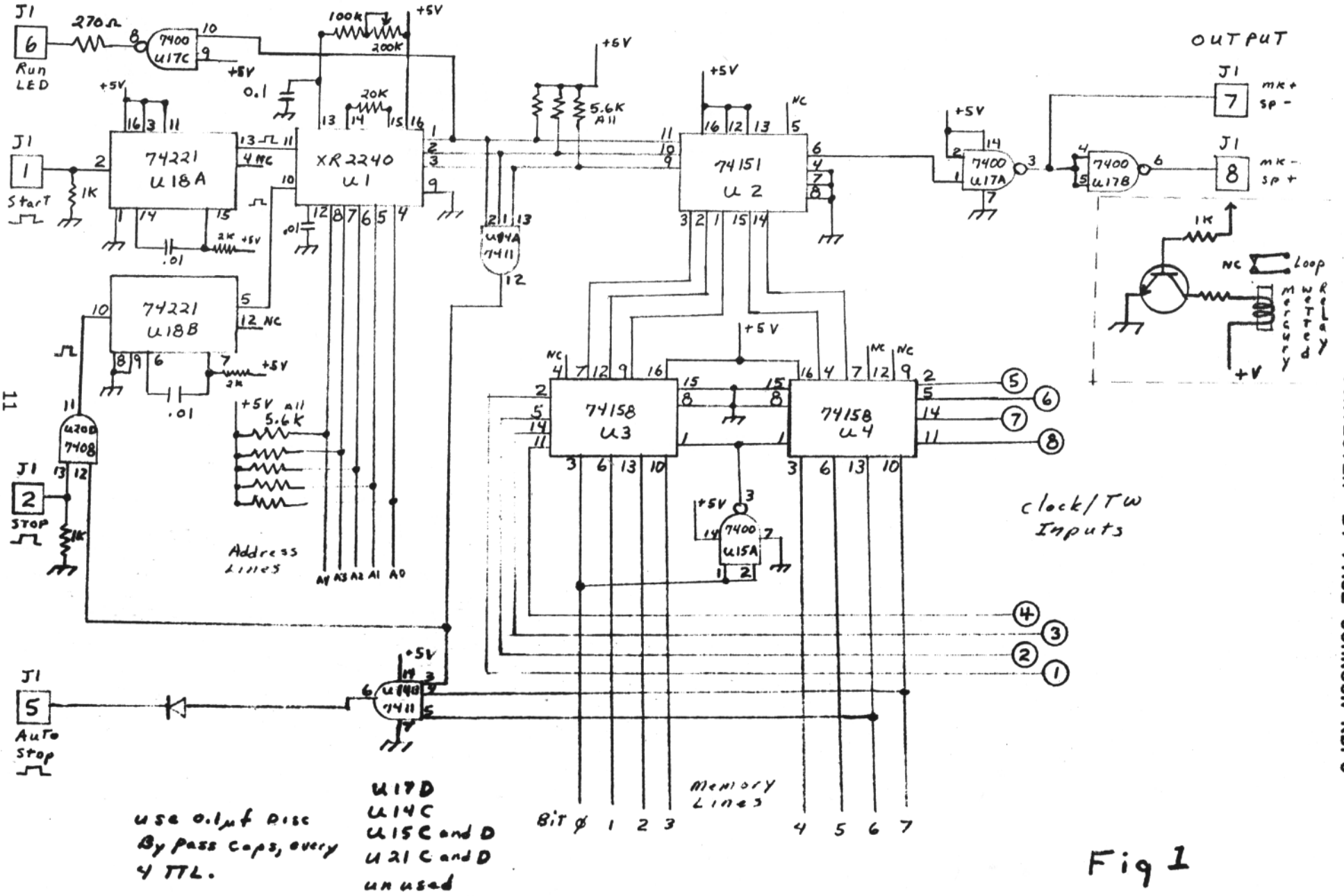


Fig 1

"THE EPROM CONTESTER" BY PAUL JOHNSON KØPJ

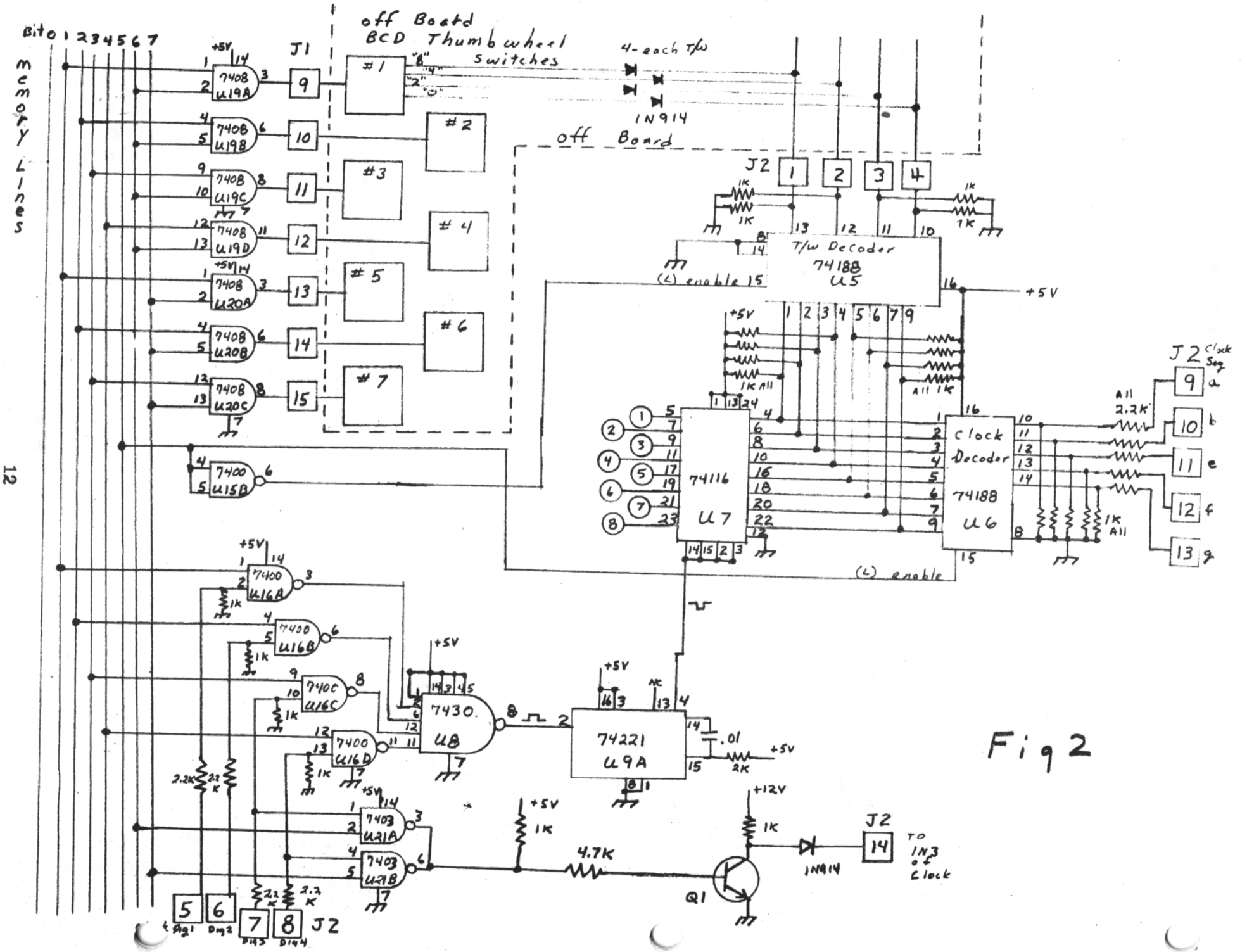

Bit 0 1 2 3 4 5 6 7
Memory Lines
off Board
BCD Thumbwheel Switches
"8"
"4"
"2"
"1"
#1
#2
#3
#4
#5
#6
#7
4-each T/W
1N914
off Board
J1
J2
7408 U19A
7408 U19B
7408 U19C
7408 U19D
7408 U20A
7408 U20B
7408 U20C
7400 U15B
T/W Decoder 74188 U5
(L) enable 15
+5V
1K All
All 1K
74116 U7
Clock Decoder 74188 U6
All 2.2K
1K All
J2 Clock Seg
(L) enable
7400 U16A
7400 U16B
7400 U16C
7400 U16D
7430 U8
74221 U9A
.01
2K
2.2K
22K
7403 U21A
7403 U21B
4.7K
1K
+12V
Q1
1N914
J2 14
TO IN3 of Clock
J2 5 6 7 8
Dig1 Dig2 D143 D144
12

Fig 2

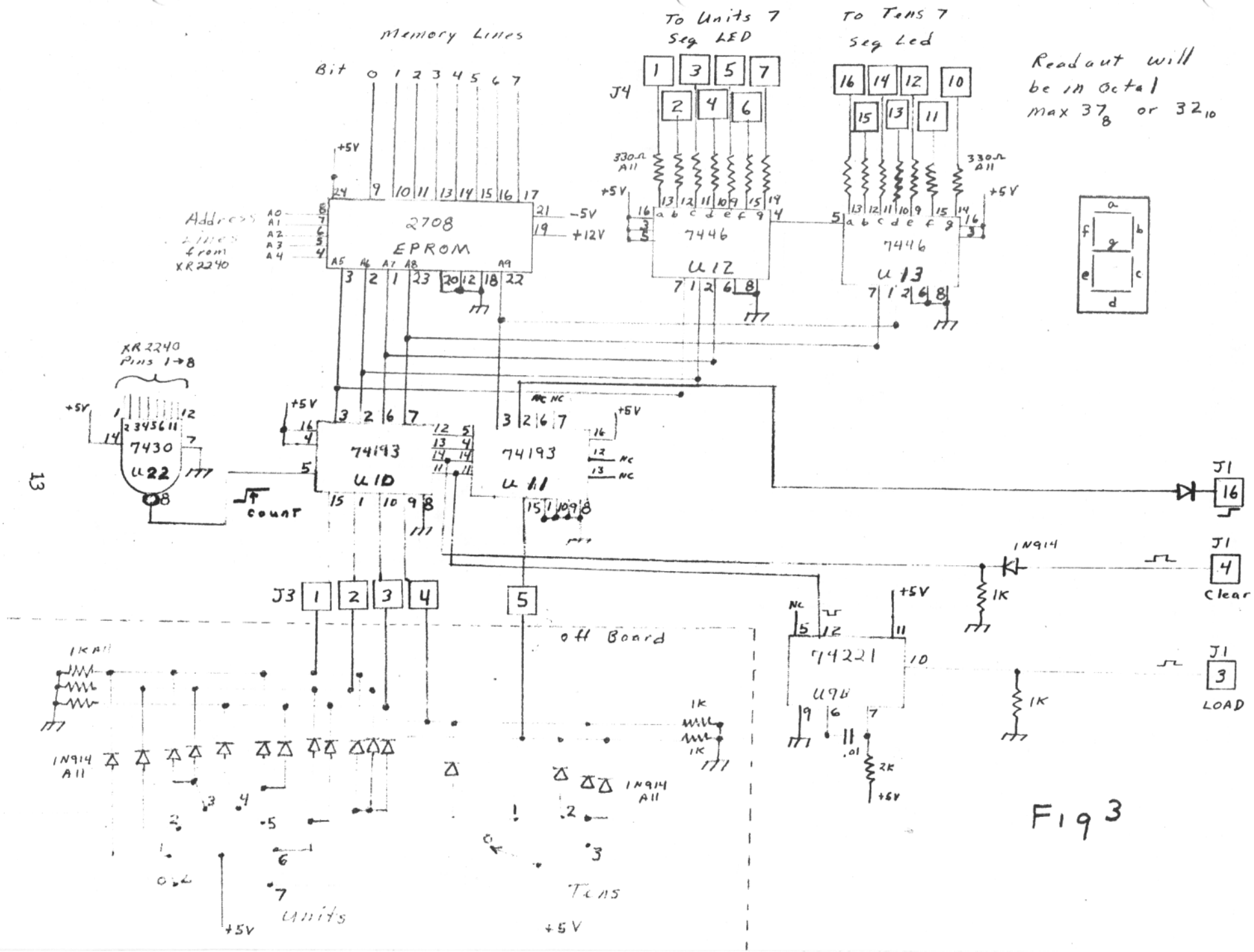

Memory Lines
Bit 0 1 2 3 4 5 6 7
To Units 7 Seg LED
To Tens 7 Seg Led
Readout will be in Octal max 37_8 or 32_{10}
J4
330Ω All
+5V
2708 EPROM
Address lines from XR2240
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9
-5V
+12V
7446
U12
U13
a b c d e f g
XR2240 Pins 1→8
7430
U22
count
74193
U10
U11
NC
J1
16
IN914
1K
4
Clear
J3
1 2 3 4 5
off Board
74221
U96
.01
2K
+5V
3
LOAD
1K All
IN914 All
Units
Tens
0 1 2 3 4 5 6 7
0 1 2 3

Fig 3

I hope that the five diagrams on these last pages have given you an inkling into the really fine article coming in the next issue of the RTTY JOURNAL. Please do not lose these diagrams as they will not be repeated. Your editor Dee

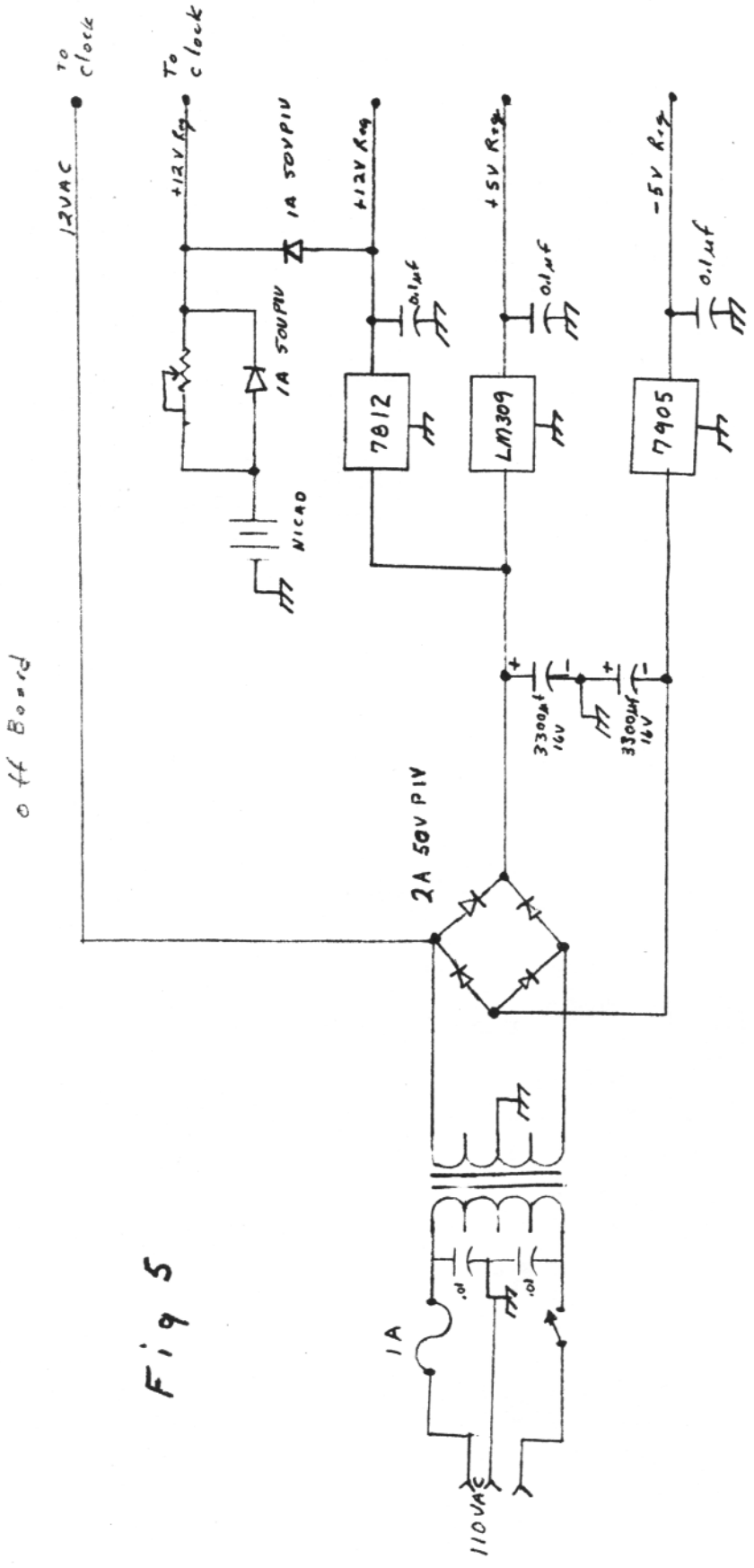


Fig 5

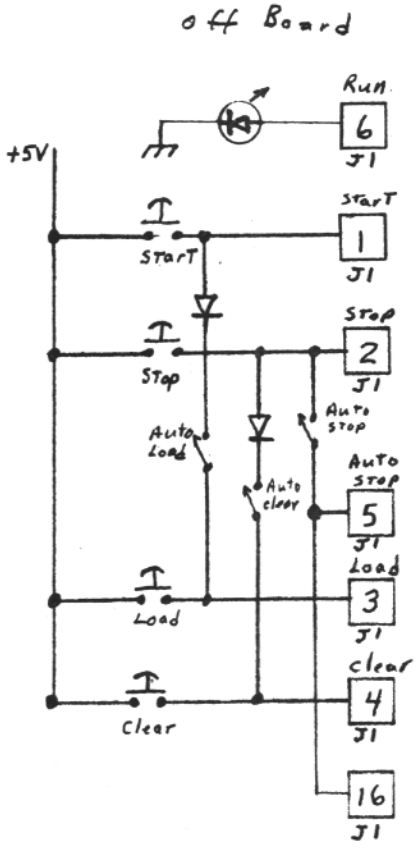
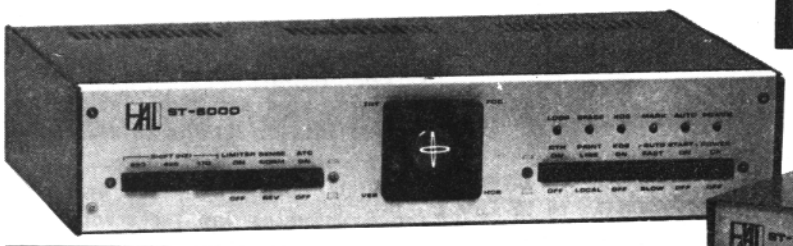


Fig 4

Even WEAK SIGNALS print clearly with a HAL Demodulator.

ST-6000 Demodulator $659.00



ST-5000 Demodulator $239.00

Pulling in weak or distorted signals with a HAL Demodulator is no problem. Even if the band is crowded.

With high-gain, wide-bandwidth limiters and extremely linear active detector circuits, both the ST-6000 and ST-5000 Demodulators convert RTTY tones into strong, readable signals that display bright and clear.

Tones necessary for transmitting RTTY are conveniently generated and receive filters and transmit tones are accurately set and matched to assure on-the-money transceive operation.

Both the ST-6000 & ST-5000 offer these features:
Internal Loop Supply • Internal AFSK Generator with CW ID Tone • Internal Tuning Indicator • Autostart Motor Control • Line/Local Loop Control • TTY Machine Compatibility • RS-232 type DATA Interface • "High" or "Low" Tones • 120/240, 50/60 Hz Power • Normal/Reverse Switch • 170 and 850 Shift • Active Discriminator • Metal Cabinets for RF Shielding.

Special Features of the ST-6000:
Mark-Hold • Antispace • Automatic Threshold Control (ATC) • Decision Threshold Hysteresis (DTH) • Keyboard Operated Switch (KOS) • MIL-188 and CMOS Data Interface • Oscilloscope Tuning Indicator • Crystal Controlled AFSK Tones • Active Input Bandpass Filter • Pre-Limiter AGC • Three Shifts (170 - 425 - 850)

Write or give us a call. We'll be glad to send you our new RTTY catalog.

HAL COMMUNICATIONS CORP.
Box 365
Urbana, Illinois 61801
217-367-7373

For our European customers, contact: Richter & Co. D3000 Hannover 1 • I.E.C. Interelco, 6816 Bissone/Lugano • Radio Shack Ltd., London NW6 3AY • Erik Torpdahl Telecom, DK 3660 Stenlose Denmark

The output of the slicer stage of a demodulator such as the popular ST-6 is +12 volts in the mark state and -12 volts in the space state. This is just the opposite of the RS-232C standard for interfacing. The slicer output is connected to a conditioning circuit consisting of two transistors in order to convert it to TTL levels for the serial input of the UART, Pin 20.

Fig. 3 shows a timing diagram of a character traveling through the UART. Note that the output of the slicer, + and - 12 volts, is converted to +5 and)volts at pin 20. Pins 12, 11, 10, 9, and 8 are the 1st, 2nd, 3rd, 4th and 5th bits of the Baudot code, respectively. These output pins do not change state until clocked by a data strobe generated within the UART. This data strobe signal is available at pin 19 of the UART. It is used by both the IF-2 circuit and by the transmitter section of the UART. It is the task of the transmitter section of the UART to convert the parallel data at pins 26,27,28,29 and 30 back to serial data at pin 25.

The TTL output level at pin 25 of the UART is not capable of directly driving the demodulator's keying transistor. Therefore, an additional conditioning circuit consisting of two switching transistors connected as inverters is used to drive the keying transistor. IC2 is the clock for the UART and its output is available at the test point (marked T.P. on the PC board). It should be set at sixteen times the baud rate. For 60 WPM operation, this means a frequency of 727 HZ (16 X 45.45).

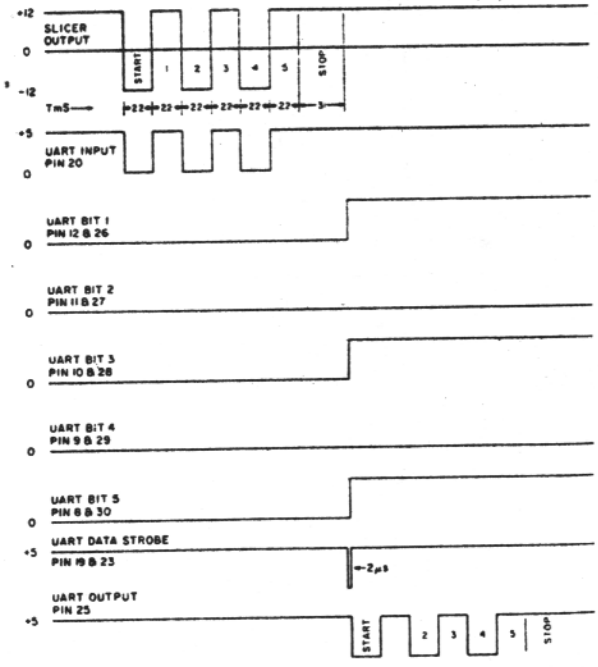


Fig. 3. UART timing chart.

DECODING

The main purpose of the IF-1 circuit is to convert the serial data to parallel data so that all five bits of data are available simultaneously. Our next task is to decode these five bits of data so that each of the 32 possible Baudot characters has its own output port. To accomplish this end, two 4-line to 16-line decoders are used. Each of these is capable of decoding a 4-bit binary number and addressing one of 16 outputs. Since the Baudot code is a five bit code with 32 combinations, we use two of these chips to obtain the necessary output ports. Only one of these chips is on at a time. In addition, only one of the 32 outputs is low at any given time. Table 1 shows the truth table for this Baudot decoding circuit. Pins 18 and 19 of the 74154 are gates that must be low to enable the chip. Note in Fig.2 that an inverting transistor circuit has been added to ensure that pins 18 and 19 of IC1 are always the complement of pins 18 and 19 of IC2. While IC1 is enabled, IC2 is disabled and vice versa. Only one of the 32 outputs of IC1 and IC2 are low; all remaining pins are high. The net effect of this circuit is to decode one of 32 outputs with 5 address lines. These 32 outputs are now available for programming any 4-character sequence for the Selcal and any 7-character sequence for the WRU.

SEQUENCE DETECTION

Now that the Baudot code has been decoded and there is a unique output port for each character, we must detect the sequence of these characters. In addition, if an incorrect

Binary Address			A_3	A_2	A_1	A_0	Low	Low	Character	
Bit Number	5	5	4	3	2	1	Pin	Pin		
IC1 Pin Number		18,19	20	21	22	23	of	of		
IC2 Pin Number	18,19		20	21	22	23	IC1	IC2		
	H	L	L	L	L	L	1		Blk	
	H	L	L	L	L	H	2		E	3
	H	L	L	L	H	L	3		LF	
	H	L	L	L	H	H	4		A	
	H	L	L	H	L	L	5		SP	
	H	L	L	H	L	H	6		S	
	H	L	L	H	H	L	7		I	8
IC1 ON	H	L	L	H	H	H	8		U	7
IC2 OFF	H	L	H	L	L	L	9		CR	
	H	L	H	L	L	H	10		D	
	H	L	H	L	H	L	11		R	4
	H	L	H	L	H	H	13		J	
	H	L	H	H	L	L	14		N	
	H	L	H	H	L	H	15		F	
	H	L	H	H	H	L	16		C	
	H	L	H	H	H	H	17		K	
	L	H	L	L	L	L		1	T	5
	L	H	L	L	L	H		2	Z	
	L	H	L	L	H	L		3	L	
	L	H	L	L	H	H		4	W	2
	L	H	L	H	L	L		5	H	
	L	H	L	H	L	H		6	Y	6
	L	H	L	H	H	L		7	P	0
IC1 OFF	L	H	L	H	H	H		8	Q	1
IC2 ON	L	H	H	L	L	L		9	O	9
	L	H	H	L	L	H		10	B	
	L	H	H	L	H	L		11	G	
	L	H	H	L	H	H		13	Fig	
	L	H	H	H	L	L		14	M	
	L	H	H	H	L	H		15	X	
	L	H	H	H	H	L		16	V	
	L	H	H	H	H	H		17	LTR	

Table 1. Baudot decoding chart.

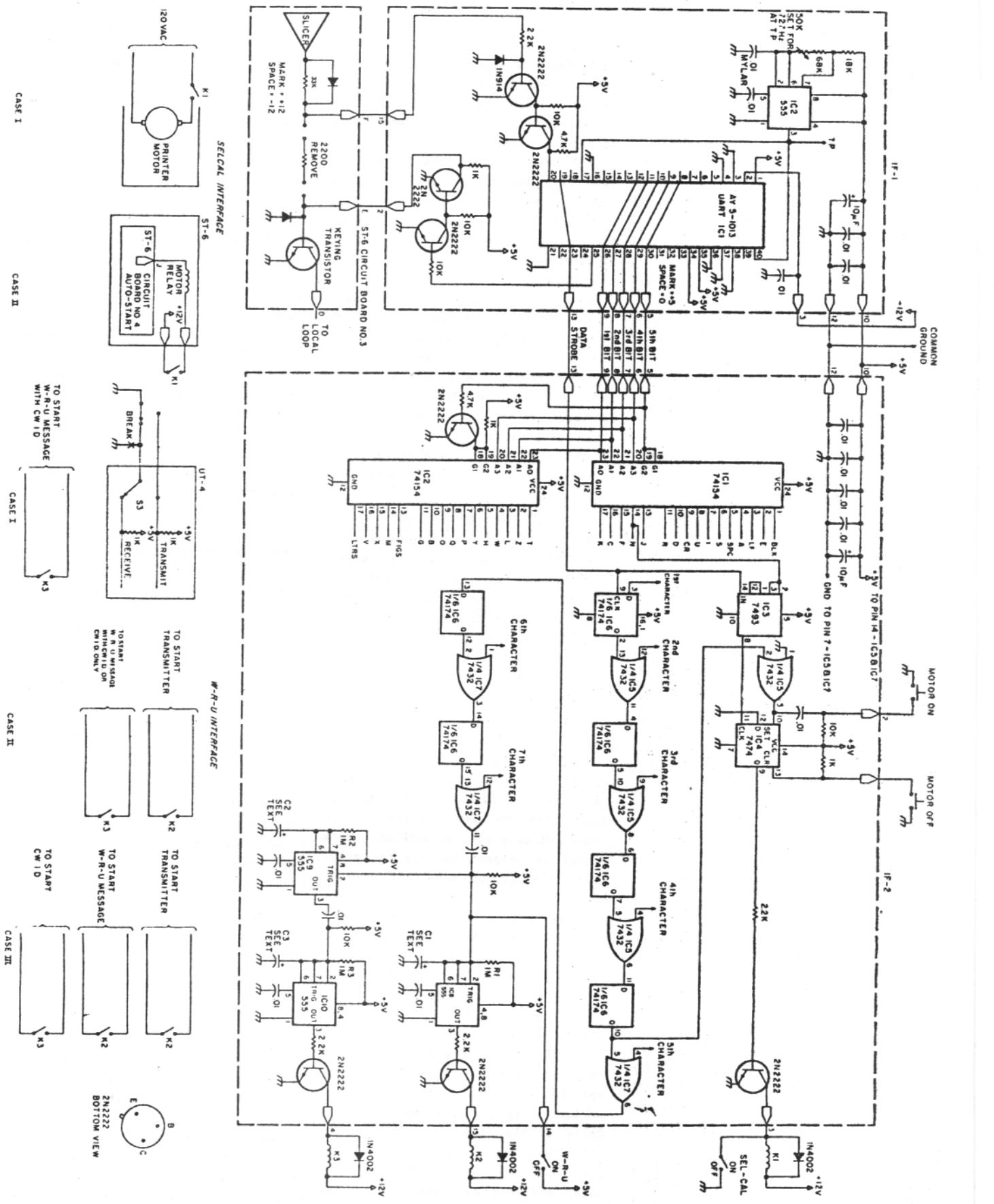


Fig. 2. IF-1, regenerative repeater, IF-2, Selcal and W-R-U schematic.

character or sequence is detected, the entire sequence must be started again. This task is accomplished by IC6 and IC5. IC6 is a 74174 hex D-type flip-flop. This chip contains 6 flip-flops that will pass along the data on the input (D) to the output (Q) only on the positive going edge of the clock pulse. The clock pulse is supplied by the data strobe output of the UART.

Let's go through an example to illustrate the sequence detection process.The sequence circuit starts with all inputs and outputs high. Pin 3 of IC6 goes low on the first character. The UART data strobe then clocks the flip-flops and this low state is transferred to the output,pin 2. This output is then ORed with the second character. Let us assume the second character is not part of the correct access code. Therefore, pin 12 of IC5 will be high,pin 11 will be high, and hence the output of the second flip-flop, pin 5, will remain high. More importantly, the entire sequence must be started over again since there is now a high state on pin 3 of IC6 and hence on its output. Now let us assume the second character coincides with the correct access code;pins 11, 12, and 13 of IC5 will all be low. This low is then passed on to the next OR gate. This process remains the same for the 3rd and 4th characters. If the correct sequence is used a low state finally appears at the 4th flip-flop,pin 10 of IC6. This low state is used to force the teleprinter motor on. If at any point an incorrect character is used, all outputs go high.

The WRU access code simply requires 3 additional characters to trip the WRU circuits. The detection of these characters occurs in a similar manner;however,an additional chip (IC7) is required.

NNNN SHUTDOWN DETECTION

Now that we have turned on the teleprinter by using the correct access code, we must provide a means of turning it off. The customary code sequence to turn off the teleprinter is NNNN.

The heart of the NNNN shutdown circuit is a binary counter,IC3,a 7493. This chip simply counts the number of Ns. Pins 2 and 3 are enable pins that must be low for the chip to count. Since these pins are connected to the N output port of IC1, the chip is allowed to count only when an N is decoded. The input,Pin 14, is connected to the UART data strobe. As seen from the timing chart,Fig,3, a 2-microsecond pulse is generated by the UART for each and every character. However, the 7493 only counts Ns because it is disabled for all other characters.

IC4, a 7474, is a bistable latch that controls the teleprinter through relay K1. When the proper sequence has been detected by the Selcal sequence circuit, the output of IC4 is set, and when the NNNN shutdown code has been detected by IC3, the latch is,in essence,reset. Pins 10 and 13 of IC4 are used to externally force the motor on or off via the momentary switches.

SELCAL INTERFACING

The Selcal may be integrated into the RTTY station in several ways. Fig.2 shows two Selcal interfacing schemes. Case 1 shows the teleprinter motor controlled directly by the Selcal. This is the easiest method, and for those without a demodulator with autostart, the only method.

IF-2 SELCAL CONTINUED

Case 2 is a superior interfacing technique for several reasons. By controlling the ST-6 demodulator motor relay, we have, in essence,ANDed the autostart circuit in the demodulator with the Selcal circuit. This means not only must an authentic RTTY signal be present to trip the autostart circuit,but also the correct character sequence must be received. This means less of a chance of accidental turnons. More importantly, if the other station forgets to send 4 Ns,the teleprinter will turn off when the RTTY signal ceases. Of course, you are now running simple autostart since the teleprinter will turn on now with any RTTY signal, but with the next staton sending 4 Ns will reset the circuit. Another advantage of Case 2 is the fact that the motor relay of the ST-6 also controls the selector magnet loop current. Therefore, not only is the teleprinter's motor off, but also the 60 mA local loop current.

WRU INTERFACING AND TIME CONSTANT CALCULATIONS

Integrating an answerback system into an RTTY station is more complicated than interfacing the Selcal. The variety of ways is also greater. Fig.2 shows 3 possible methods.

Let's start with Case 3 first. In this interfacing scheme,it is assumed the station has a message-generating unit and a CW ID unit. Now let us assume that the WRU message lasts 20 seconds, and the CW ID requires 10 seconds. This means the transmitter must be on for a total of 30 seconds to allow both the WRU message and CW ID to be broadcast. The "on" time of the transmitter is determined by the RC time constant of IC8. The time constant is given by approximately R x C. Since R is fixed at 1 meg for all timers (IC8,IC9,and IC10),the necessary capacitance for a 30 second time delay is 30 uF. Therefore, this means that when the WRU access code is received,relay K2 will be energized for an interval of 30 seconds. K2 is a two-pole relay that simultaneously controls the transmitter and message-generating unit in this case. Since K2 is actuated for 30 seconds, the transmitter will be on for this 30-second period. Relay K2 also enables the message generator for 30 seconds. Since the message is 20 seconds long,the message generator used in this case must be able to inhibit itself after the 20-second message is complete. After 20 seconds has elapsed,the message is finished and we will want to start the CW ID. The time before the CW ID starts is determined by IC9. Here the capacitance necessary for C2 is approximately 20 uF, giving 20-second delay. After IC9 has timed out,we want to start the CW ID. If you have an electronic CW ID unit,chances are a momentary closure of K3 will be satisfactory. Therefore,C3 may be 1 uF to give a 1-second contact closure. If your CW ID unit requires a closure of K3 for the entire 10-second duration of the CW ID transmission,C3 should be 10 uF.

Using the formula will only get you into the ballpark. The actual capacitance values for C1,C2,and C3 will have to be determined through trial and error.

The case 2 interfacing method assumes that a unit that sends a message followed immediately by a CW ID is used. This is the method I use and it works as follows. Let's assume the message and CW ID transmission require a total of 30 seconds. Let us also assume that we do not want to start the message for 10 seconds. While this may seem strange it is really a very nice feature. For with this method, the person receiving your message has a grace period of 10 seconds to turn switches and tune your signal in properly before the message and CW ID begins. This scheme requires the transmitter to be on for 40 seconds,the 10 second grace period plus the 30 seconds required for the message and CW ID. Therefore,C1 should be 40 uF. Since we want to pause for 10 seconds before starting the message and CW ID,we set C2 at 10uF.Assuming the CW ID unit requires only a momentary contact closure to start the message and CW ID,C3 is set at 1uF for a closure of relay K3 equal to 1 second. This interfacing method is also ideal for those amateurs with only a CW ID unit. For while it is nice to have a RTTY message followed by a CW ID, only the CW ID is legally necessary. Therefore relay K3 may be used to simply start the CW ID.

The last interfacing scheme,Case 1, is for those fortunate RTTY enthusiasts with a UT-4. The actual time constants remain the same as in Cases 2 and 3,the only difference being in the circuit used to turn on the transmitter. Interfacing the WRU circuit with the UT-4 switch,S3,is shown in Case 1.

POWER SUPPLY

Fig.4 shows a power supply schematic that will supply all the necessary voltages for this project. However,the entire supply may not be required. For example,if 12 volt relays are not used in your particular interfacing scheme,the +12 volt dc source is not required.

The UART is the only IC that requires the -12 volt dc source and the current drain is quite small.If you have an ST-6,the -12 volt supply of the ST-6 could easily handle this load.

The +5 volt is used by both the IF-1 and IF-2 boards. The IF-1 circuit requires approximately 20 mA while the IF-2 circuit requires approximately 200 mA. Both current requirements can be easily hangled by the +5 voly supply shown in Fig.4.

CONSTRUCTION.

Construction of the project is made simpler by using printed circuit boards. The boards available from this author are professionally fabricated and drilled.

The IF-1 board requires six jumpers. Also note that the 4 transistors on this board will require the leads to be bent to conform to the PC board layout. The IF-2 board requires 8 jumpers plus seven programming jumpers. The dot next to each integrated circuit on the board signifies pin 1 of each chip. The IC number is also on the board to help designate the proper location of each chip. The numbers 1 through 7 located near ICs 5,6,and 7 represent one end of the program jumper wires. The other end of each of these wires is connected to the desired characters of IC1 and IC2.

If the builder wishes only to fabricate a Selcal without the WRU circuit,many components may be deleted. Fig.8 indicatesby dots those components that are not required for the WRU.

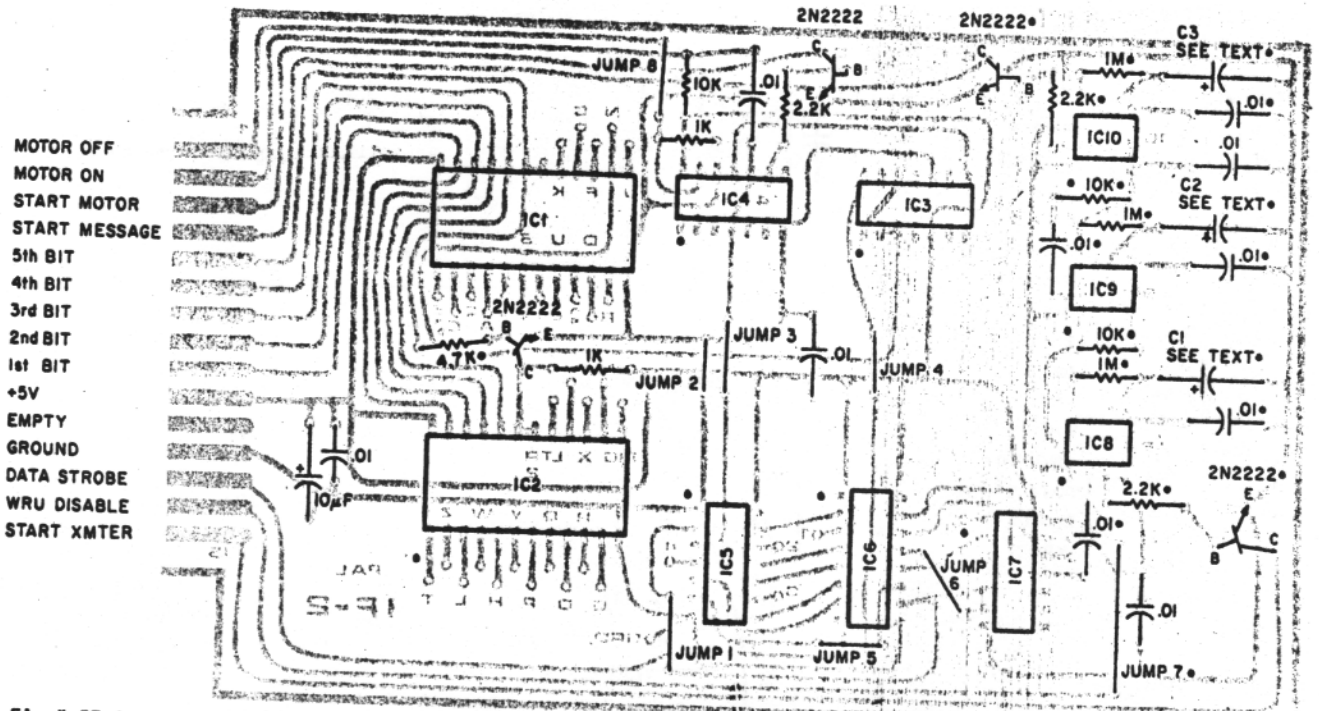


Fig.* IF-2 component placement ICs 7,8,9,10 and those components denoted by dots are not required for SELCAL only.

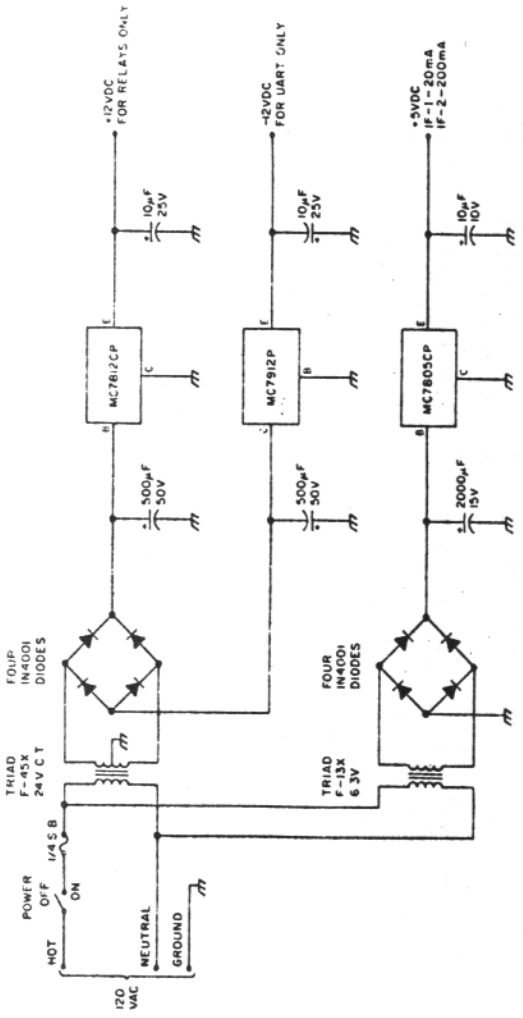


Fig. 4. Power supply.

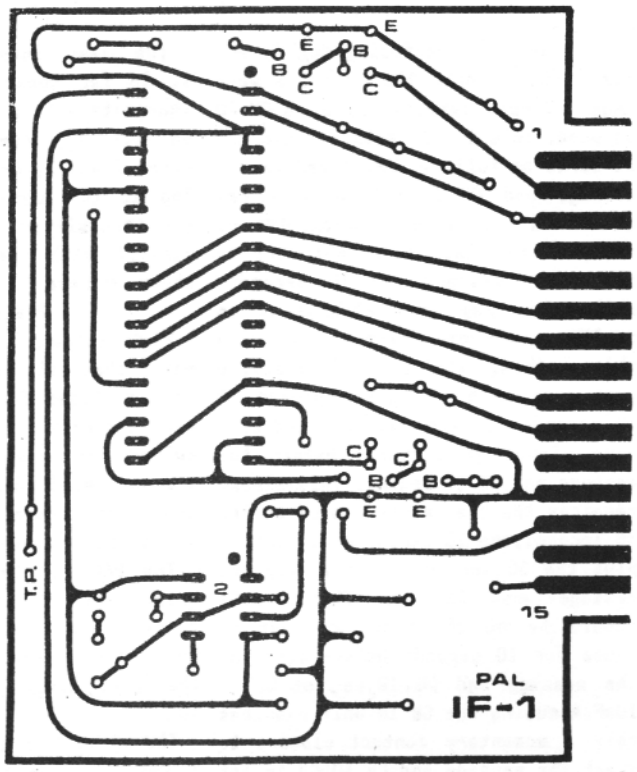


Fig. 5. IF-1 printed circuit board layout (full size).

EMPTY
OUTPUT
-12V
EMPTY
5th BIT
4th BIT
3rd BIT
2nd BIT
1st BIT
+5V
EMPTY
GROUND
DATA STROBE
EMPTY
INPUT

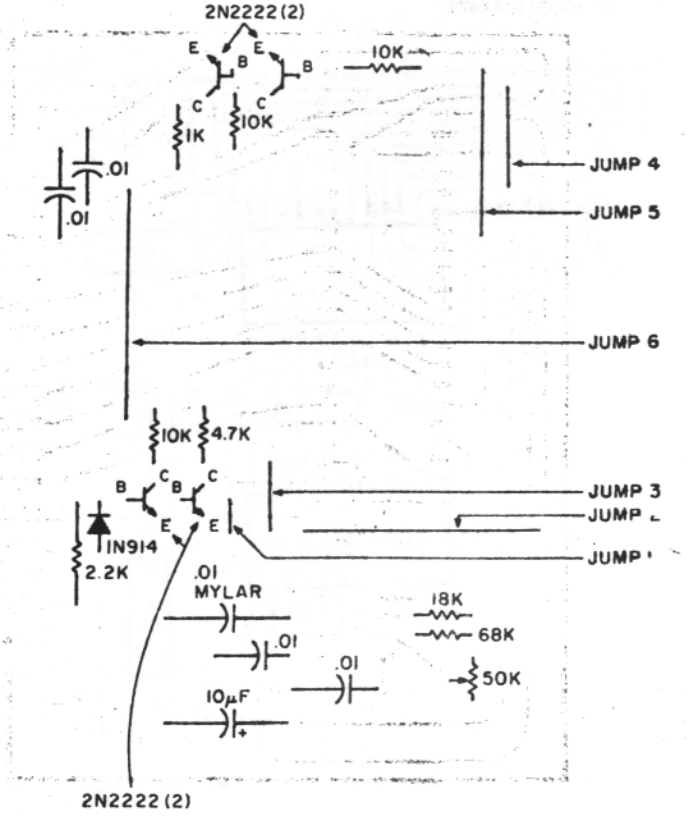


Fig. 6. IF-1 component placement.

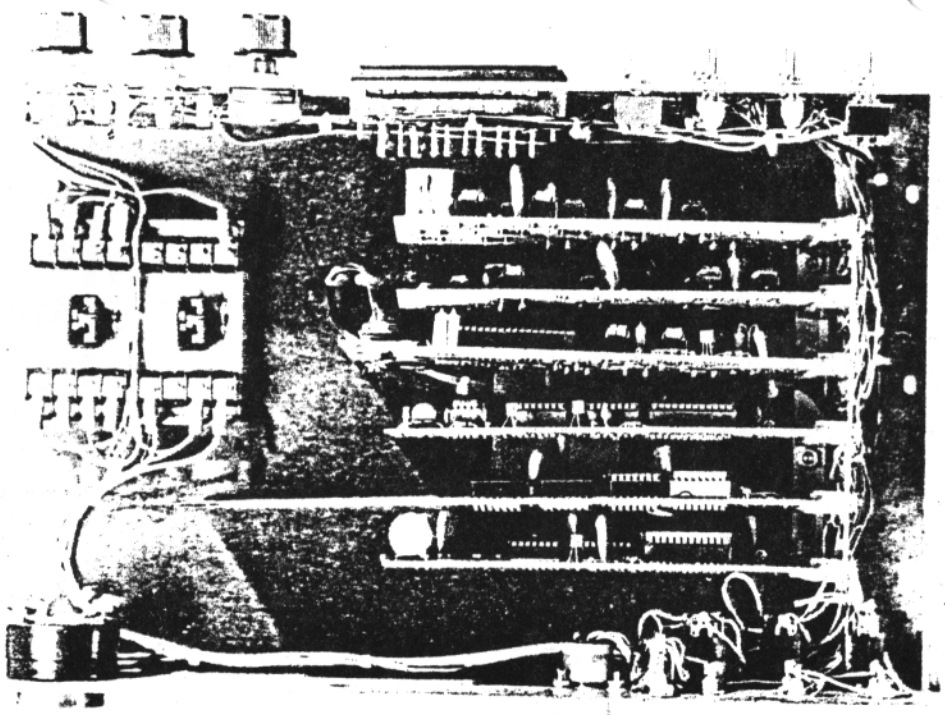


Photo 5. Top view of the UT-4 and IF-2 unit. Note the UART parallel data wires leaving the third board from the front. This is the board shown to the extreme right in Photo 3. These wires are terminated on the IF-2 board fourth from the front.

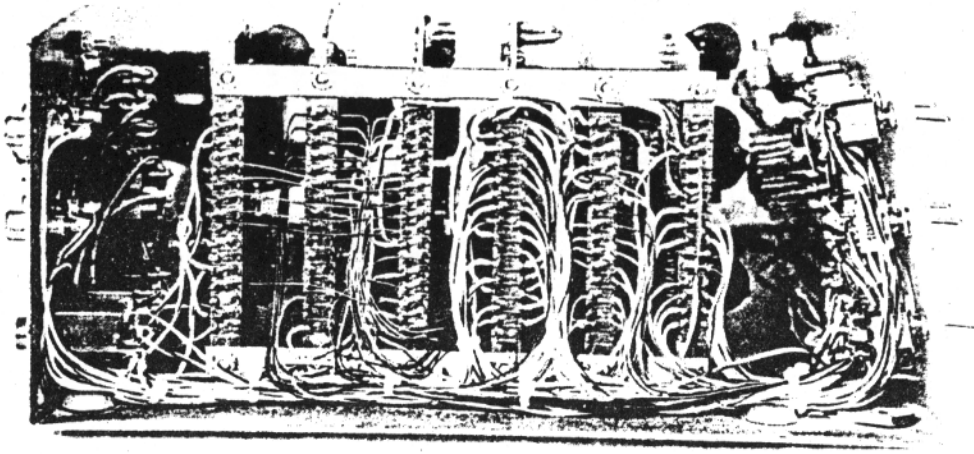


PHOTO 6 Side view of the IF-2 and UT-4 unit.Using this construction method to mount the edge card connectors is especially nice since it allows easy access to the connector pins.

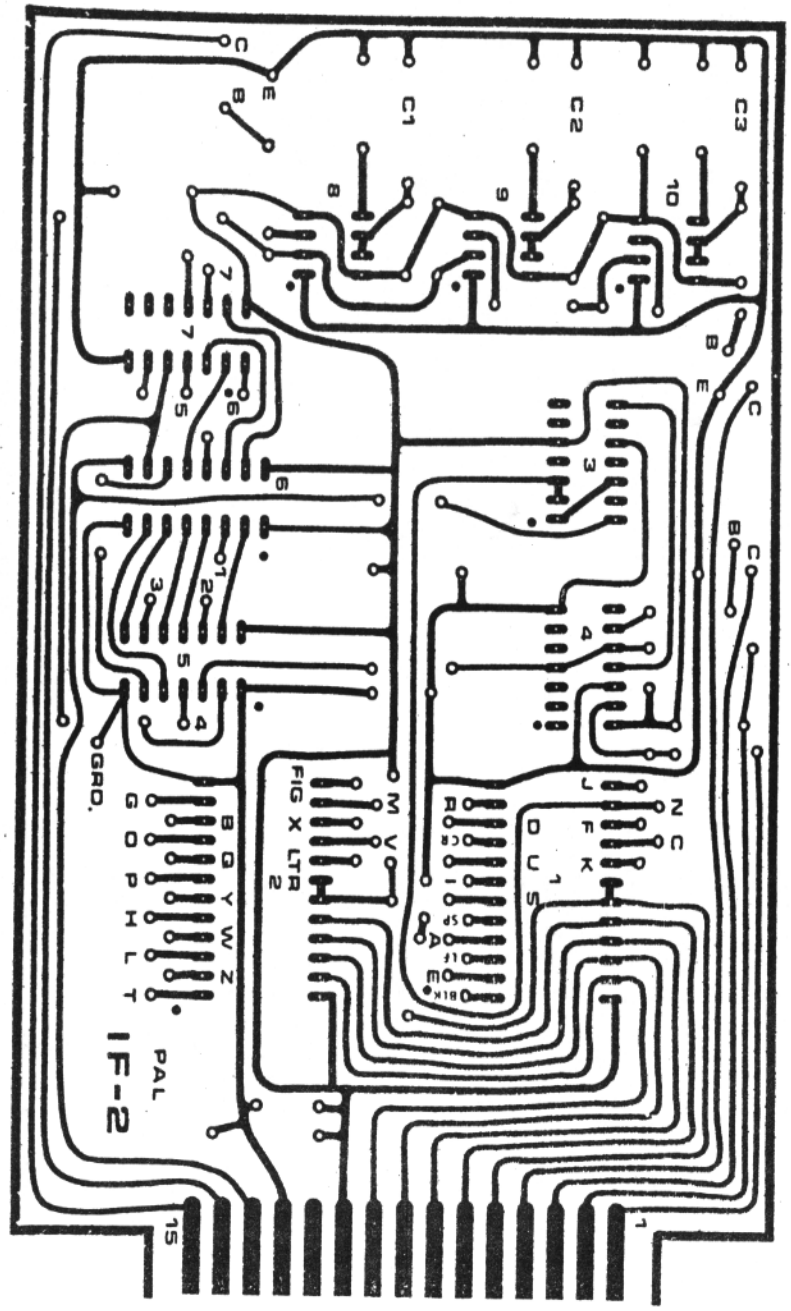


Fig. 7. IF-2 printed circuit board layout

If you have a UT-4 and have used printed circuit boards for the project, you may be wondering how to pick off the necessary data points from the printed circuit board. Photos 4,5 and 6 show a UT-4 that has been interfaced to an IF-2. Note in particular Photo 5. This photo shows at the extreme right a UT-4 board with the UART on it. In this case,an extension was added which contained a connector. The wires were then run from the connector to the necessary points on the UART.

ACCESS CODE PROGRAMMING

The access code to trip the Selcal can be anywhere from one to four characters in length. While it is customary to use only the last three characters of a station's call,the exact number of characters will be a function of the letters. Certainly a station with the call W6AND would not want to use only the last three characters (AND) since the word AND occurss frequently in English text. In this example,the Letters character would be added as a fourth character before the letter A to prevent premature turn-ons. While any character may be added,the Letters character is a natural since it would normally go after the number 6 and precede the letter A when the call is normally typed. Therefore,in this case,our four character access code would be: Letters,A,N,and D. These four characters are programmed on the IF-2 board by four jumper wires. The first character,Letters, is programmed by connecting a wire from pin 3 of IC6 to pin 17 of IC2. The IF-2 printed circuit board has the number 1 next to pin 3 of IC6,indicating this is the first character to be programmed.Next to pin 17 of IC2 the abbreviation LTR is shown, indicating this to be the termination point if a Letters character is desired. In a similar manner the second character A would be programmed by connecting a wire between pin 12 of IC5 (2nd character) and pin 4 od IC1 (A character). This procedure would be followed for the remaining characters N and D.

Now suppose your call is WA2ILP. The letters I,L,and P are not likely to occur consecutively in a normal conversation. Therefore,Three characters should be adequate as an access code for the Selcal. Since there is a need for only three of four possible characters,the first character, pin 3 of IC6,is grounded. The characters I,L and P then become the second,third and fourth characters of the access code,respectively. The IF-2 printed circuit board has a hole marked GRD for the purpose of grounding the first character (pin 3 of IC6) should a three character access code be desired.

For those with a two letter call, you might find it necessary to use 4 characters for the access code. For example, in my call W9IF,I use the following four-character access code: 9,Letters,I,and F.Refering to the Baudot code, you will see that the number 9 has the identical code as the letter O. Therefore, the first character (pin 3 of IC6) would be connected to the letter O (pin 9 of IC2). The remainder of the call would be programmed as previously discussed.

The access code to trip the answer-back system consists of a total of 7 characters. The first four are the Selcal characters. Three additional characters,typically,Figures,Blank, and H make up the remainder of the access code. These three characters represent the 5th,6th,and 7th characters of our access code. To program Figures as the 5th character, a wire is connected between pin 4 of IC7 and pin 13 of IC2. The 6th and 7th characters are programmed in a similar manner.

Other WRU access codes are Figures, Blank,and W, and more recently,W,R, and U. The IF-2 printed circuit board gives the user complete flexibility in determining the answer-back access code.

In summary, a typical 4-character access code to turn on the teleprinter might be Letters,A,N, and D. The access code to trip the answer-back system for this station might then be the following seven characters: Letters,A,N,D,Figures,Blank,and H.

CONCLUSION

The Selcal and WRU answer-back system has been in operation for over 2 years now without any problems.When I recently received my two-letter call, reprogramming the access code required only a few minutes. The Selcal has enabled me to keep contact with friends,and the WRU has given them the confidence to send a note knowing it will be received.

For those not familiar with some of the more popular autostart frequencies, they are as follows: on 80 meters,3637.500 and 3617.500 kHz; and on 20 meters,14,082.500 and 14,075.000 kHz.

I would like to thank Cal Sondgeroth,W9ZTK for some design ideas, and Spence Clope,W9LDH for fabricating a unit to confirm design validity.

REFERENCES

Fehlauer,W."What's a WRU?" RTTY JOURNAL July-Aug 1976 p.4.

Hoff,I. "The Mainline UT-4" RTTY JOURNAL,Feb.,Mar.,Apr.,May 1974.

Lichtenwalner,B.,"The Computer QSO Machine",73,Jan 1976 p 80.

Magee,j. "ZAP!",Kilobaud Feb '77,p 18.

Malanowicz,D., RTTY JOURNAL,Apr.1976 p 3.

Sanders,L. "RTTY Autocall-the digital way",73,Feb,1976 p 76.

Sonderoth,C., "An RTTY Selcal with TTL Logic" 73,Nov.1972 p 20.

PRINTED CIRCUIT BOARD PARTS LIST.

QUANTITY	DESCRIPTION
1	AY-5-1013 (UART, IC1)
1	LM555 (timer, IC2)
1	1N914 diode
4	2N2222 transistor
1	1k ¼ W resistor
1	2.2k ¼ W resistor
1	4.7k ¼ W resistor
3	10k ¼ W resistor
1	18k ¼ W resistor
1	68k ¼ W resistor
1	50k potentiometer
1	.01 uF mylar capacitor (timing)
4	.01 uF ceramic capacitor
1	10 uF tantalum capacitor

IF-2 Selcal Only

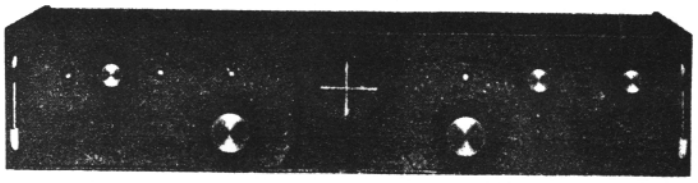
2	74154 (4-line-to-16-line decoder, IC1, IC2)
1	7493 (binary counter, IC3)
1	7474 (4-bit bistable latch, IC4)
1	7432 (quad OR gate, IC5)
1	74174 (hex D-type flip-flops, IC6)
2	2N2222 transistor
2	1k ¼ W resistor
1	2.2k ¼ W resistor
1	4.7k ¼ W resistor
1	10k ¼ W resistor
5	.01 uF ceramic capacitor
1	10 uF tantalum capacitor

IF-2 with W-R-U

additional components are required for the W-R-U

1	7432 (quad OR gate, IC7)
2	2N2222 transistor
2	2.2k ¼ W resistor
2	10k ¼ W resistor
3	1 meg ¼ W resistor
5	.01 uF ceramic capacitor
3	C1, C2, C3 tantalum capacitor (see text)

DOVETRON

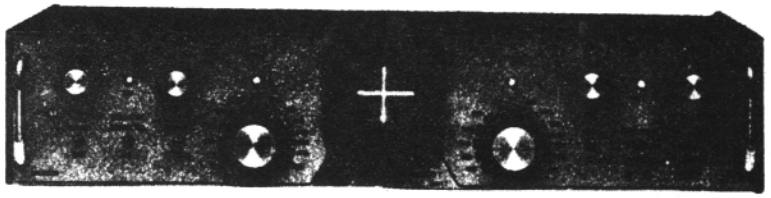


MPC-1000C

Multipath Correction
In-Band Diversity &
AFSK Tone Keyer

Amateur Net: $545.00

Standard features include CONTINUOUSLY tuneable Mark and Space channels (1000 Hz to 3200 Hz), Dual Mode (MARK or FSK) Autostart and internal high level neutral loop keyer (20 to 60 ml). Both EIA and MIL FSK outputs are provided for direct interface to microprocessor and video terminal peripherals.

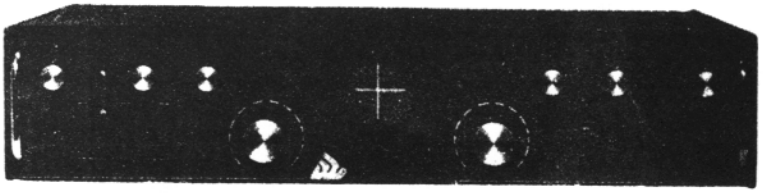


MPC-1000CR

Signal Regeneration &
Speed Conversion

Amateur Net: $645.00

A front panel switch permits internal TSR-200 Signal Regenerator-Speed converter assembly to electronically "gear-shift" between 60, 67, 75 and 100 WPM. All incoming and outgoing signals are regenerated to less than 0.5% bias distortion. Also available with DIGITAL Autostart (TSR-200D): Amateur Net: $695.00



MPC-1000R/-TSR-500

Dual UART Regeneration,
Speed Conversion, 200
Char. Memory, Word Correction & DIGITAL
Autostart

Amateur Net: $895.00*

The MPC-1000R/TSR-500 provides Preloading and Recirculation of the 200 character FIFO Memory, a keyboard-controlled Word Correction circuit, Variable Character Rate, Tee Dee Inhibit, Blank/LTRS Diddle, a Triple Tone-Pair AFSK Tone Keyer and a Character Recognition/Speed Determination DIGITAL (DAS-100) Autostart mode.

*The MPC-1000R is also available without a TSR assembly and functions as a MPC-1000C with a Triple Tone-Pair AFSK Tone Keyer. This "Basic-R" permits future expansion with a TSR-100, TSR-200, TSR-200D or TSR-500 by simply lifting the lid and plugging in the appropriate TSR assembly: Amateur Net (Basic-R): $595.00

Your QSL will bring complete specifications, or call: 213-682-3705.

DOVETRON

627 FREMONT AVENUE
(P. O. BOX 267)
SOUTH PASADENA, CA. 91030

RTTY Journal

SECOND CLASS PERMIT PAID
AT ENCINITAS, CA 92024

PO BOX RY

Cardiff by the Sea, CA. 92007