

The  
**HANDIMAN'S GUIDE**  
to the  
**TEN TEC SCOUT 555**

by Paul Harden, NA5N

**T**he model 555 Ten Tec Scout is one of the most unique ham radios ever built with the band module concept for a simple full functioned 50 watt CW/SSB HF rig — and it's 5W QRP cousin, the model 556 Argo. It's small size, by 1990 standards, made it ideal for portable and mobile use. The Scout remains a unique and excellent little HF transceiver still today with that legendary Ten Tec performance. The Scout was the most popular transceiver ever produced by Ten Tec, being manufactured over an 8-1/2 year run from late 1992 through 2001. More Scouts were manufactured than any other Ten Tec model. They sell today used in the \$500–600 range, about what the Scout cost new in the 1990s.

**Maintenance and Troubleshooting.** The Scout/Argo is a mess inside and a mechanical packaging marvel, but doesn't take long to learn your way around. It really is a very clever, well designed transceiver circuit. Unfortunately, the Ten Tec Scout/Argo manual contains only very basic alignment procedures and no troubleshooting aids. The board photos are next to useless for parts identification. Many circuits and filters are shared for both receive and transmit, switched by a host of diodes, that can be confusing at first.

To assist those needing to understand, troubleshoot or repair their Scout or Argo, I have prepared the following illustrations based on my experience and some reverse engineering. I have an Argo and three Scouts (one a surface mount version), one of which I use regularly on the air for CW and mostly QRP.

**PCB Parts Layout drawings** of the three main boards shows all major components including most diodes, along with the function of the board connectors and a few other details. The connectors, active components, and diodes are a good place to find yourself in the schematic and for signal tracing.

**Functional Block Diagram drawings** show the major circuit elements and the signal flow in both RX and TX, since many of the circuits are shared, including signal flows through the band modules.

**Cautions.** The output levels of the PTO and the LO from the band modules varies from band-to-band and unit-to-unit which effect most other Scout signal levels. The oscpe waveforms shown are typical with the 20M band module and will show this variability between different units and band modules, but are sufficient for tracing signals through the circuit for proper gains and levels, or identifying a failure. The AGC ensures proper receiver performance and the TX ALC ensures full 50W output to compensates for these changes in signal power.

I certainly hope you find this information helpful in understanding the Scout circuitry and for troubleshooting and repair if needed, as so little detailed information or parts layout seems available.

73/72, Paul NA5N

**5495\*  
FACTORY DIRECT**

- 558 and CW
- Modifiable for all ten bands
- 160 - 10 meters
- Half the size of other "small" transceivers
- 50 watts output
- Legendary QSK
- Built off 72 volts

ADDITIONAL MODULES: \$25.00 each. \*This shipping and handling.

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MADE IN USA

A 1993 ad for the Ten Tec Scout

TITLE **TEN TEC SCOUT 555**  
**RECEIVER CONTROL BOARD**

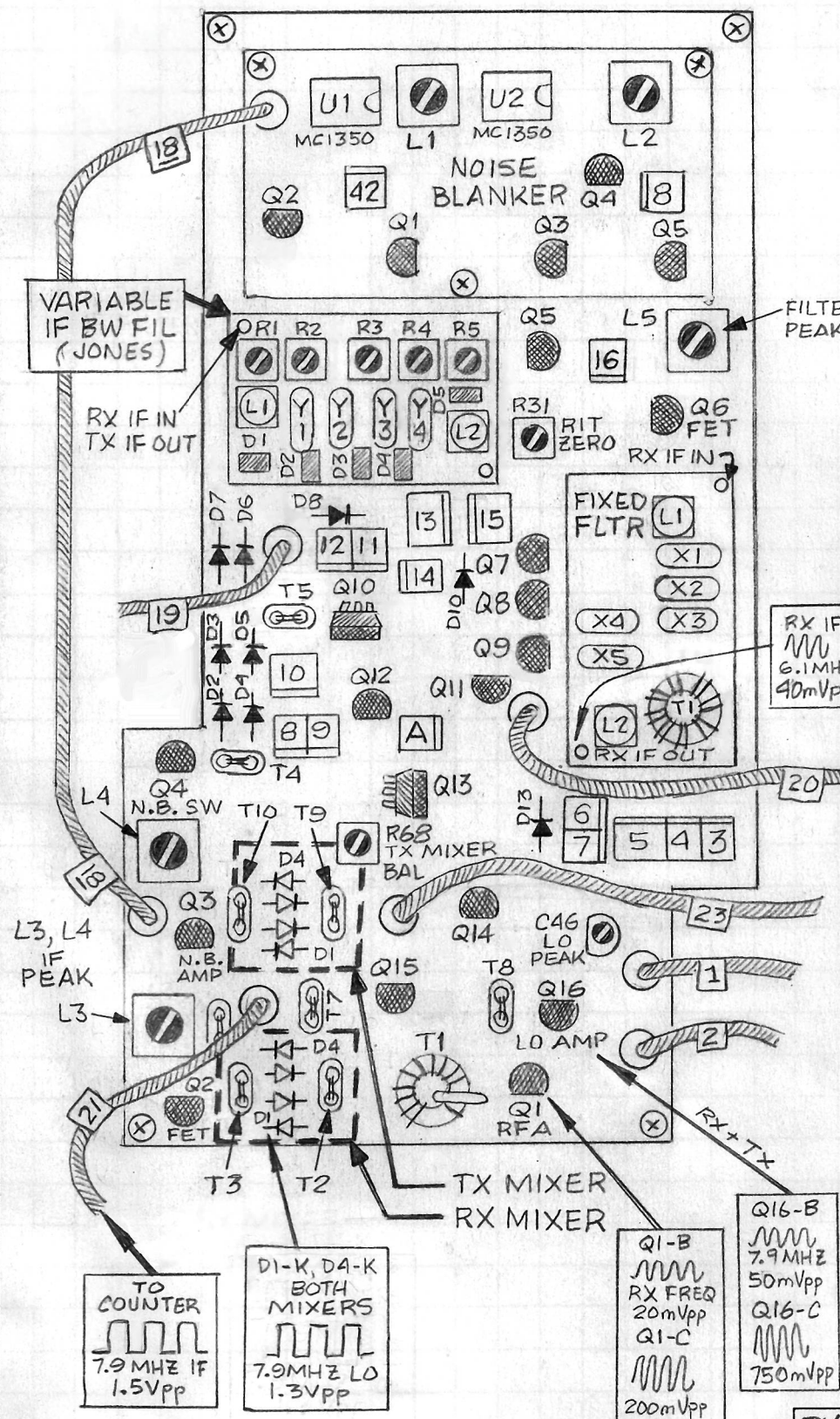
SHEET OF  
 DATE **OCT, 2020**

**TEST CONDITIONS**

RX: 20M, INJECT 20mVpp (-30dBm) AT ANT.  
 TX: 20M, DUMMY LOAD, CW KEY DOWN

**CONNECTORS**

- 3 GND
  - 4 +13V
  - 5 GND +13V FM PWR SW
  - 6 +REG (10V)
  - 7 PTT
  - 8 MIC VOLT.
  - 9 KEY
  - 10 NB PULSE BLANKING
  - 11 R
  - 12 T
  - 13 +REG (10V)
  - 14 BFO +REG
  - 15 SIDETONE +REG (10V)
  - 16 PTO UNLOCK
  - 17 RIT ON/OFF
  - 18 PTO LOCK
  - 19 RIT BIAS 10K
  - 20 PTO LOCK +REG (10V)
  - 21 RIT
  - 22 IF BW POT
  - 23 +REG (10V)
  - 24 N.B. SW ON = +REG
- 1 LO IN FM BAND MODULE
  - 2 RX ANT IN /TX IF OUT
  - 3 IF TO N.B.
  - 4 BAL MOD CARRIER IN
  - 5 RX IF OUT /TX IF IN
  - 6 LO TO FREQ COUNTER
  - 7 TX MIXER 6MHz IF IN



TO COUNTER  
 7.9 MHz IF  
 1.5Vpp

D1-K, D4-K  
 BOTH MIXERS  
 7.9 MHz LO  
 1.3Vpp

Q1-B  
 RX FREQ  
 20mVpp

Q1-C  
 200mVpp

Q16-B  
 7.9 MHz  
 50mVpp

Q16-C  
 750mVpp

Q2, Q6 J310 FET  
 Q10, Q13 MJE370 PNP

DSG BCE

BY: Paul Harden N4SN

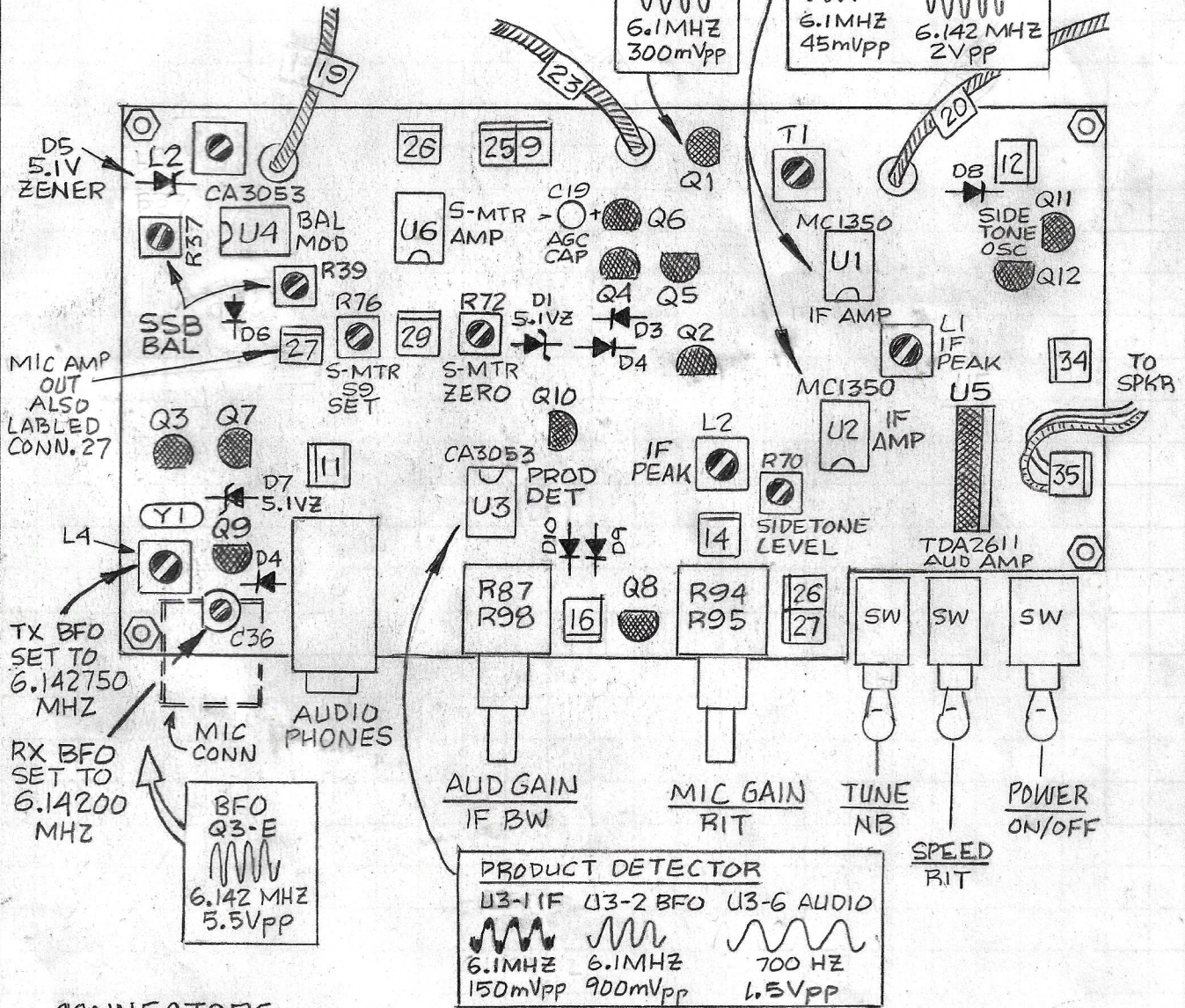
**TEST CONDITIONS**

RX: 20M, INJECT 20mVpp (-30dBm) AT ANT.  
 TX: 20M, DUMMY LOAD, CW KEY DOWN

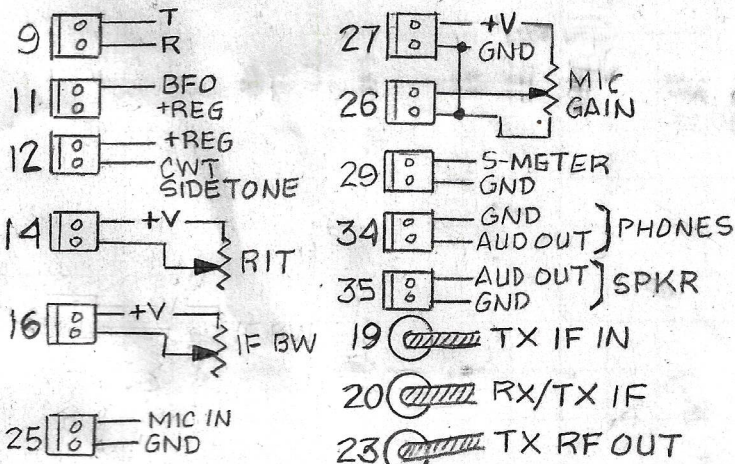
**TX IF**  
 Q1-B, E  
  
 6.1MHZ  
 300mVpp

**IF AMPS (RX)**  
 U1-4 IN U2-8 OUT  
  
 6.1MHZ  
 45mVpp

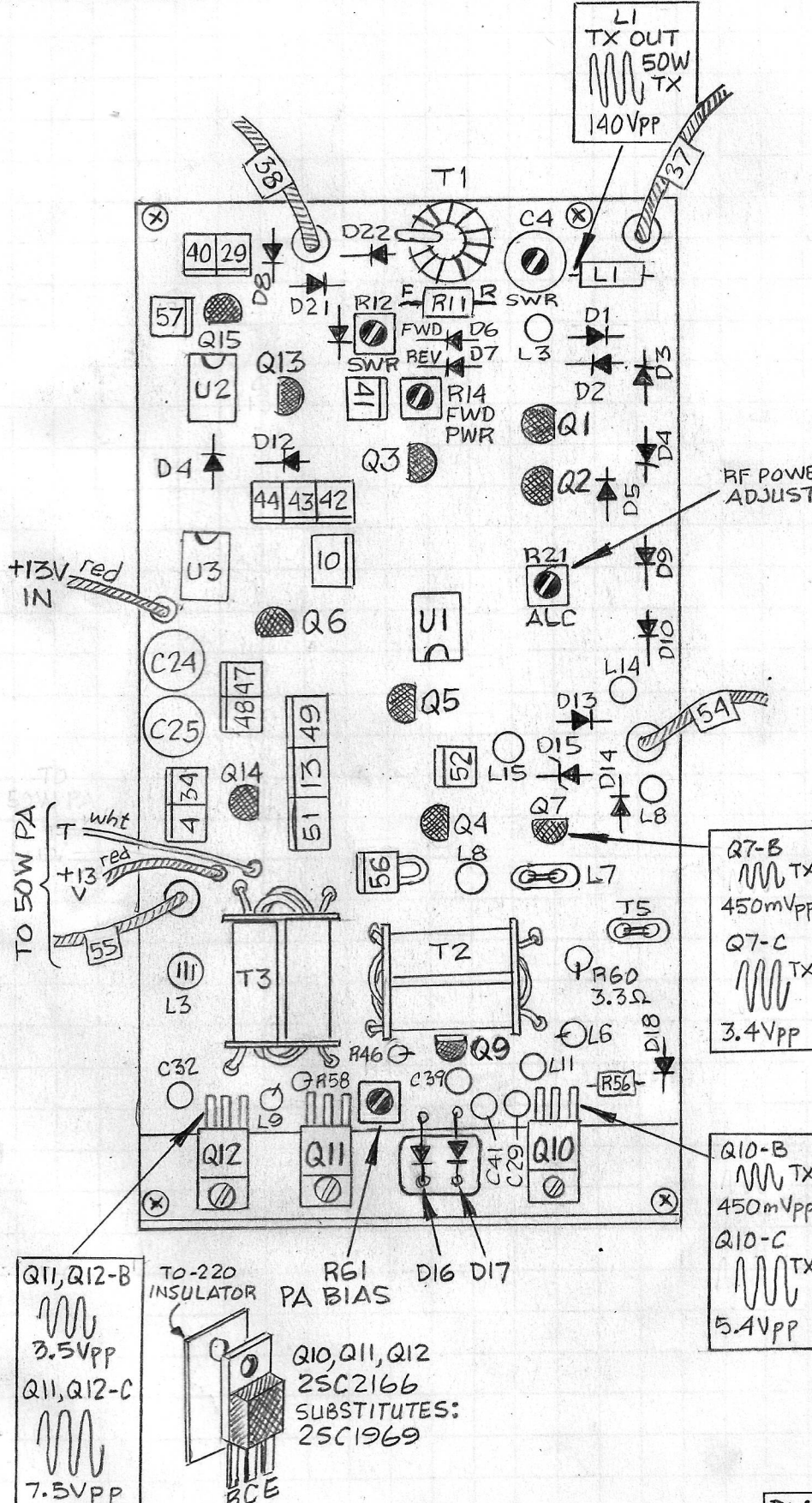
6.142MHZ  
 2Vpp



**CONNECTORS**



BY: Paul Harden N45N



**CONNECTORS**

- 4 +13V IN  
GND
- 10 +REG (10V)  
T  
R
- 13 UNLOCK  
RIT ON/OFF  
LOCK
- 29 S MTR IN  
GND
- 34 +13V  
GND
- 40 -S  
METER
- 41 FWD SW.  
METER  
SWR SW.
- 42 N.B. SW
- 43 TUNE SW.  
+REG  
NB SW.
- 44 TUNE
- 47 S METER  
LAMP
- 48 +REG (10V)  
BAND
- 49 SPEED  
BAND  
LOCK
- 51 RIT SW.  
+REG  
SPEED SW.
- 52 ALC  
LED
- 56 PA LINK
- 57 RIT
- 37 TO ANT  
CONN
- 38 TX LPF OUT  
BAND MODULE
- 54 RX ANT OUT.  
AND  
TX DRIVE IN  
VIA  
BPF IN  
BAND MODULE
- 55 SW DRIVE TO  
50W PA

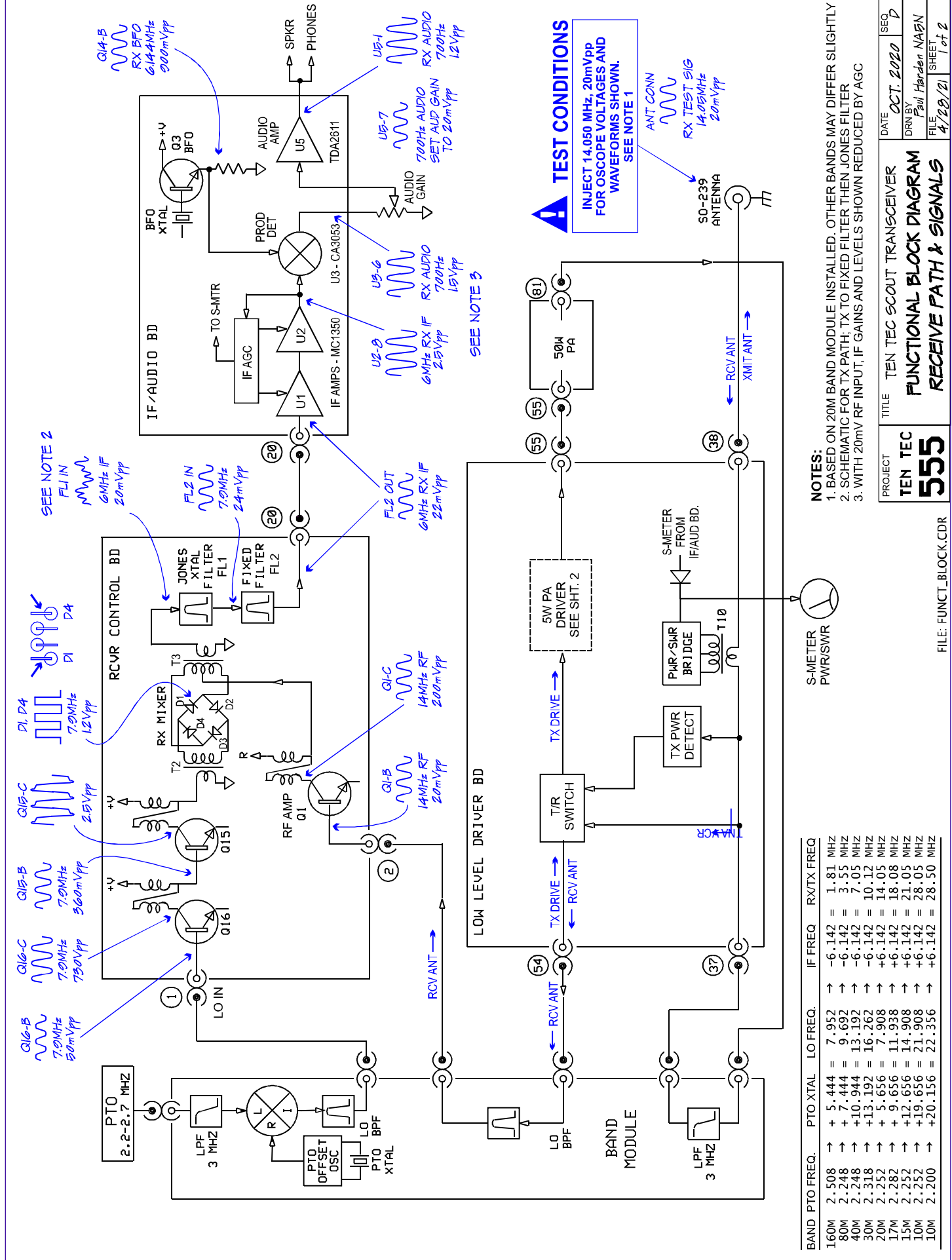
Q7-B  
 TX  
 450mVpp  
 Q7-C  
 TX  
 3.4Vpp

Q10-B  
 TX  
 450mVpp  
 Q10-C  
 TX  
 5.4Vpp

Q11, Q12-B  
 TX  
 3.5Vpp  
 Q11, Q12-C  
 TX  
 7.5Vpp

TO-220  
 INSULATOR  
  
 BCE  
 Q10, Q11, Q12  
 2SC2166  
 SUBSTITUTES:  
 2SC1969

BY: Paul Harden N4SN



SEE NOTE 2  
 FL1 IN  
 7.9MHz  
 24mVpp

Q1-B  
 7.9MHz  
 560mVpp

Q1-B  
 7.9MHz  
 360mVpp

Q1-B  
 7.9MHz  
 50mVpp

Q1-B  
 7.9MHz  
 12Vpp

FL2 IN  
 7.9MHz  
 24mVpp

Q1-C  
 7.9MHz  
 2.5Vpp

Q1-C  
 7.9MHz  
 7.0MHz  
 12Vpp

Q1-C  
 7.9MHz  
 7.0MHz  
 50mVpp

Q1-C  
 7.9MHz  
 7.0MHz  
 12Vpp

FL2 OUT  
 6MHz RX IF  
 22mVpp

Q1-B  
 14MHz RF  
 20mVpp

Q1-B  
 14MHz RF  
 200mVpp

Q1-B  
 14MHz RF  
 200mVpp

Q1-B  
 14MHz RF  
 200mVpp

U2-B  
 6MHz RX IF  
 2.5Vpp

U2-B  
 6MHz RX IF  
 2.5Vpp

U2-B  
 6MHz RX IF  
 2.5Vpp

U2-B  
 6MHz RX IF  
 2.5Vpp

U2-B  
 6MHz RX IF  
 2.5Vpp

U3-6  
 700Hz RX AUDIO  
 15Vpp

U3-6  
 700Hz RX AUDIO  
 15Vpp

U3-6  
 700Hz RX AUDIO  
 15Vpp

U3-6  
 700Hz RX AUDIO  
 15Vpp

U3-6  
 700Hz RX AUDIO  
 15Vpp

U5-7  
 700Hz AUDIO  
 SET AUD GAIN  
 TO 20mVpp

U5-7  
 700Hz AUDIO  
 SET AUD GAIN  
 TO 20mVpp

U5-7  
 700Hz AUDIO  
 SET AUD GAIN  
 TO 20mVpp

U5-7  
 700Hz AUDIO  
 SET AUD GAIN  
 TO 20mVpp

U5-7  
 700Hz AUDIO  
 SET AUD GAIN  
 TO 20mVpp

Q1-B  
 14MHz RF  
 20mVpp

Q1-B  
 14MHz RF  
 20mVpp

Q1-B  
 14MHz RF  
 20mVpp

Q1-B  
 14MHz RF  
 20mVpp

Q1-B  
 14MHz RF  
 20mVpp

Q1-B  
 14MHz RF  
 200mVpp

Q1-B  
 14MHz RF  
 200mVpp

Q1-B  
 14MHz RF  
 200mVpp

Q1-B  
 14MHz RF  
 200mVpp

Q1-B  
 14MHz RF  
 200mVpp

Q1-B  
 14MHz RF  
 200mVpp

Q1-B  
 14MHz RF  
 200mVpp

Q1-B  
 14MHz RF  
 200mVpp

Q1-B  
 14MHz RF  
 200mVpp

Q1-B  
 14MHz RF  
 200mVpp

**TEST CONDITIONS**  
 INJECT 14.050 MHz, 20mVpp  
 FOR OSCOPE VOLTAGES AND  
 WAVEFORMS SHOWN.  
 SEE NOTE 1

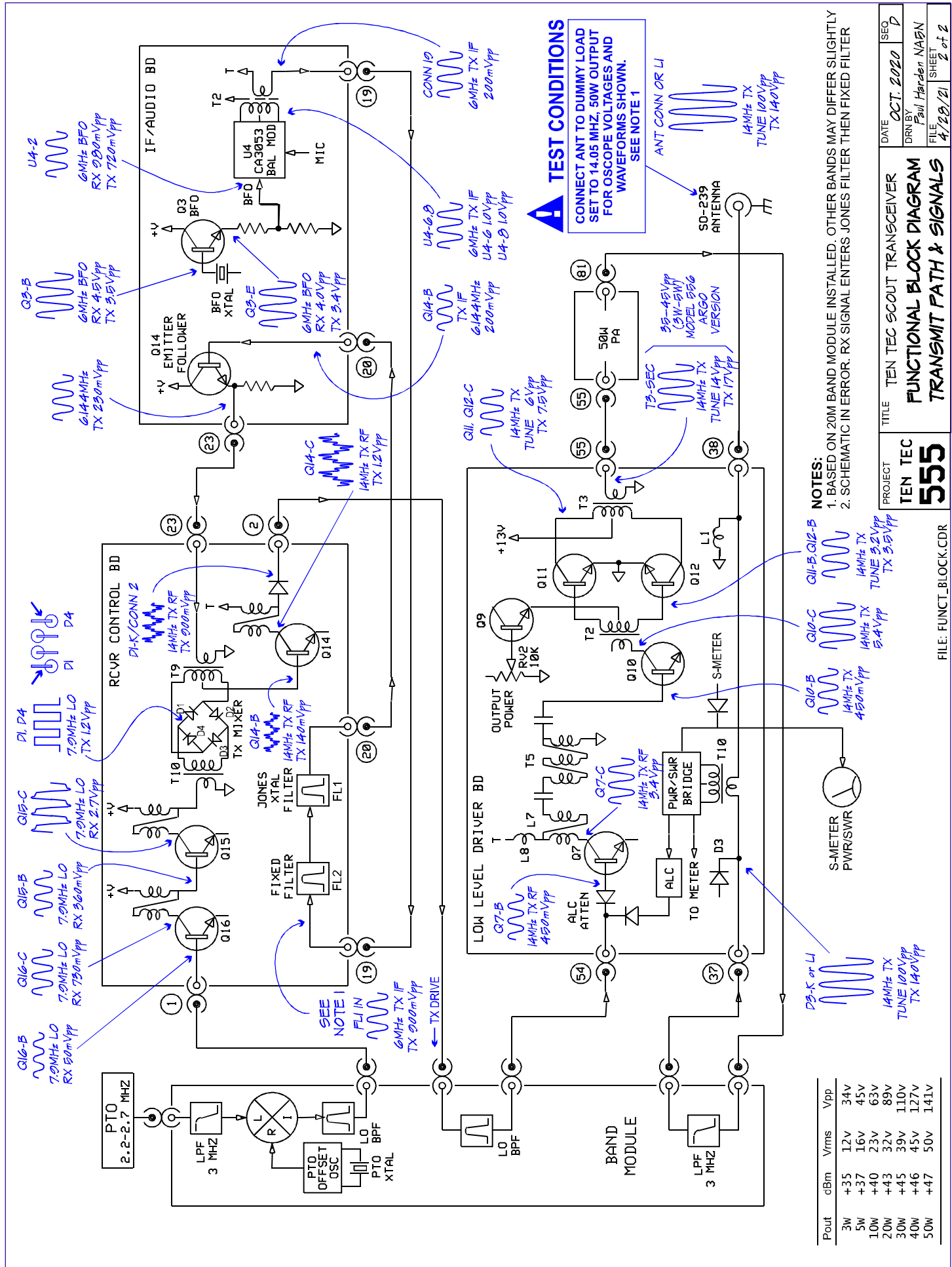
ANT CONN  
 RX TEST SIG  
 14.05MHz  
 20mVpp

**NOTES:**  
 1. BASED ON 20M BAND MODULE INSTALLED. OTHER BANDS MAY DIFFER SLIGHTLY  
 2. SCHEMATIC FOR TX PATH; TX TO FIXED FILTER THEN JONES FILTER  
 3. WITH 20mV RF INPUT, IF GAINS AND LEVELS SHOWN REDUCED BY AGC

PROJECT TITLE TEN TEC SCOUT TRANSCIVER  
**TEN TEC 555**  
 FUNCTIONAL BLOCK DIAGRAM  
 RECEIVE PATH & SIGNALS

DATE OCT. 2020  
 DRN BY Paul Harnden NAEH  
 FILE 4/20/21 SHEET 1 of 2

BAND	PTO FREQ.	PTO XTAL	LO FREQ.	IF FREQ.	RX/TX FREQ.
160M	2.508	→ + 5.444 =	7.952	→ -6.142 =	1.81 MHz
80M	2.248	→ + 7.444 =	9.692	→ -6.142 =	3.55 MHz
40M	2.248	→ +10.944 =	13.192	→ -6.142 =	7.05 MHz
30M	2.318	→ +13.192 =	16.262	→ -6.142 =	10.12 MHz
20M	2.252	→ + 5.656 =	7.908	→ +6.142 =	14.05 MHz
17M	2.282	→ + 9.656 =	11.938	→ +6.142 =	18.08 MHz
15M	2.252	→ +12.656 =	14.908	→ +6.142 =	21.05 MHz
10M	2.252	→ +19.656 =	21.908	→ +6.142 =	28.05 MHz
10M	2.200	→ +20.156 =	22.356	→ +6.142 =	28.50 MHz



**TEST CONDITIONS**  
 CONNECT ANT TO DUMMY LOAD  
 SET TO 14.05 MHz, 50W OUTPUT  
 FOR OSCCOPE VOLTAGES AND  
 WAVEFORMS SHOWN.  
 SEE NOTE 1

**NOTES:**

1. BASED ON 20M BAND MODULE INSTALLED. OTHER BANDS MAY DIFFER SLIGHTLY
2. SCHEMATIC IN ERROR. RX SIGNAL ENTERS JONES FILTER THEN FIXED FILTER

Pout	cBm	Vrms	Vpp
3W	+35	12v	34v
5W	+37	16v	45v
10W	+40	23v	63v
20W	+43	32v	89v
30W	+45	39v	110v
40W	+46	45v	127v
50W	+47	50v	141v

## Some History and Trivia . . .

Ten Tec introduced the 555 Scout/556 Argo series of HF transceivers in 1992 to be an economical alternative to the emergence of HF rigs with an over-abundance of knobs, switches, menus, bells and whistles with price tags well over \$1000 in 1990 money. Its compact size was one of the smallest HF rigs available at the time to appeal to hams looking for an all-band HF rig *easy to install and operate in a vehicle* – from trucks to small compact cars. The 50 watt (vs. 100W) output was chosen to have minimal impact on an automobile's electrical system. The optional Noise Blanker offered effective reduction of ignition noise. The Scout was a hit with mobile operators. Its novel compact size, front panel simplicity and legendary Ten Tec performance at an affordable price quickly caught on with hams for a home station as well.

It was initially advertised as an “affordable and fun” entry level rig at just \$495 and \$29 for each additional band module. Around 1995, the price increased to a still affordable \$549, where it remained for the rest of its production life. As the Scout and the market matured, later advertising included its suitability for the experienced ham or contestor as well.

The Argo was also a hit with QRPers ... a major step-up from the popular HW-8 QRP rig. The 1990s saw a strong increase in QRP enthusiasts with the introduction of inexpensive NE602 based rigs and kits such as the Emtec NW series, Small Wonder Labs offerings, NorCal kits, and the MFJ 90xx series. These were monoband rigs; the Argo (and Argonaut), were the “Cadillacs” of multi-band QRP rigs for many years being ahead of their time with full Ten Ten performance and multi-band capable. In 1998, Elecraft introduced its K1 QRP kit and SGC released its multi-band 20 watt SG-2020. Yaesu was the first global ham radio company to market a QRP-only rig, the FT-817 in 2000, as the Scout/Argo production was coming to an end.

There were only a two major changes in the Scout/Argo transceivers over its 8-1/2 year production run. The LLD drivers and Argo PA transistors were IRF510 mosfets, changed to 2SC2166 NPN transistors early in the production. Around 1996, the three main boards were converted to surface mount components (SMC), no doubt simplifying assembly at the Ten Tec plant. The circuit is identical for both thru-hole and SMC versions.

Whether for QRP or 50 watt QRO, the Scout/Argo is still a viable rig today, often sought after, due to its simplicity and excellent performance for an “analog radio,” even compared with many of today's offerings.

# SIMPLE, AFFORDABLE & FUN

DESIGNED FOR ONE REASON . . . TO HAVE FUN!  
AND BOY DOES IT DELIVER!!!

**\$549**



Change bands in a second. Just plug in desired module!

**It's SMALL**  
Makes mobile or portable fun for more hams than ever before. It's almost any car, even compact. Measuring only 2.5" X 7.25" (9.75" flat to, best compact looks in a briefcase with plenty of room to spare.

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Receiver runs circles around rigs at twice the price. 90 dB dynamic range, low phase noise design lets you hear the weak ones even on crowded bands. It's no fun if you can't hear 'em!

**It's AFFORDABLE**  
At \$549, it's half the price of the closest competition. No other rig packs so much performance on so low a price. Have fun on HF without spending a fortune.

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Crystal mixing (no synthesizer) coupled with meticulous circuit design yields sparkling clean receive audio. And you'll marvel at the unsolicited compliments on transmit audio.

**MADE IN USA**

**\$549\*** Includes one band module of your choice

**\$29\*** Each additional band module

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938 Two-Winding Supply (CMA-3 Kit)	\$75.00
700C Hand Mike	\$39.95
407 Wargled Key Paddle	\$39.00
291 Antenna Tuner	\$89.00

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We wanted to offer the most affordable HF rig in the industry and still provide real performance for even the most experienced hams. In eight years, every hams responded a “back to basics” instead of the latest design techniques, selected the best components. Now the 20 rigs we shipped over these 25 years are still used 200 hams across the country for their ideas.

**WE CALL IT THE SCOUT**  
Every hams can be mistaken in minutes. The modern rig is an easy to use. It only takes a second to change bands. Plug-in modules are available for 160-10 meters including WARC. Single conversion and crystal mixing are the foundation of this 90 dB dynamic range receiver. That's the strong signal performance of rig operating 2 times as well. It's sensitive and receive audio is sparkling clean with less than 2% distortion. The ideal solution for every band condition is at the touch of a knob. This patented “Smart” filter provides variable HF bandwidth from 200 Hz to 2.5 kHz.

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Business travelers and vacationing hams typically set up a briefcase or small

**OLD TIMERS**  
Operators with years of experience and a stack full of expensive HF gear also buy the SCOUT. By retreating to many who say “It takes 5 minutes to learn and wear off the complicated hams, there is only one thing to do with a SCOUT, work someone!” Experienced hams call it “convenient to report ‘I can't believe this receiver, it outperforms my \$1400 synthesized rig!”

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The SCOUT is the most economical way to get started in ham radio. Consider the choice to new hams must make just to get his interest in HF. It's spend nearly \$1000 or more on a new rig. It's buy a used rig and take a chance on its

**\$549\*** Includes one band module of your choice

**\$29\*** Each additional band module

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296 Mobile Blanking	\$15.00
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