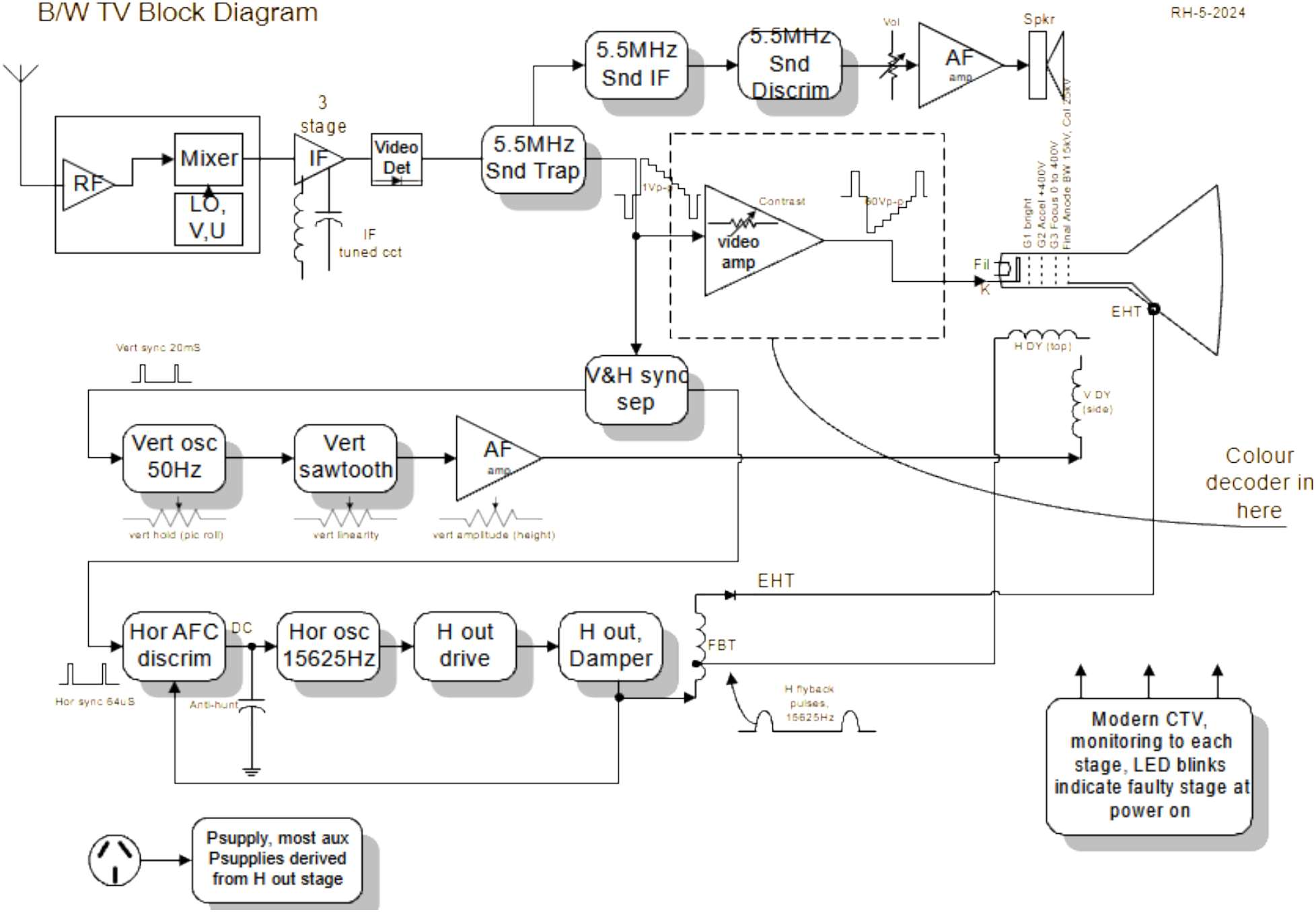
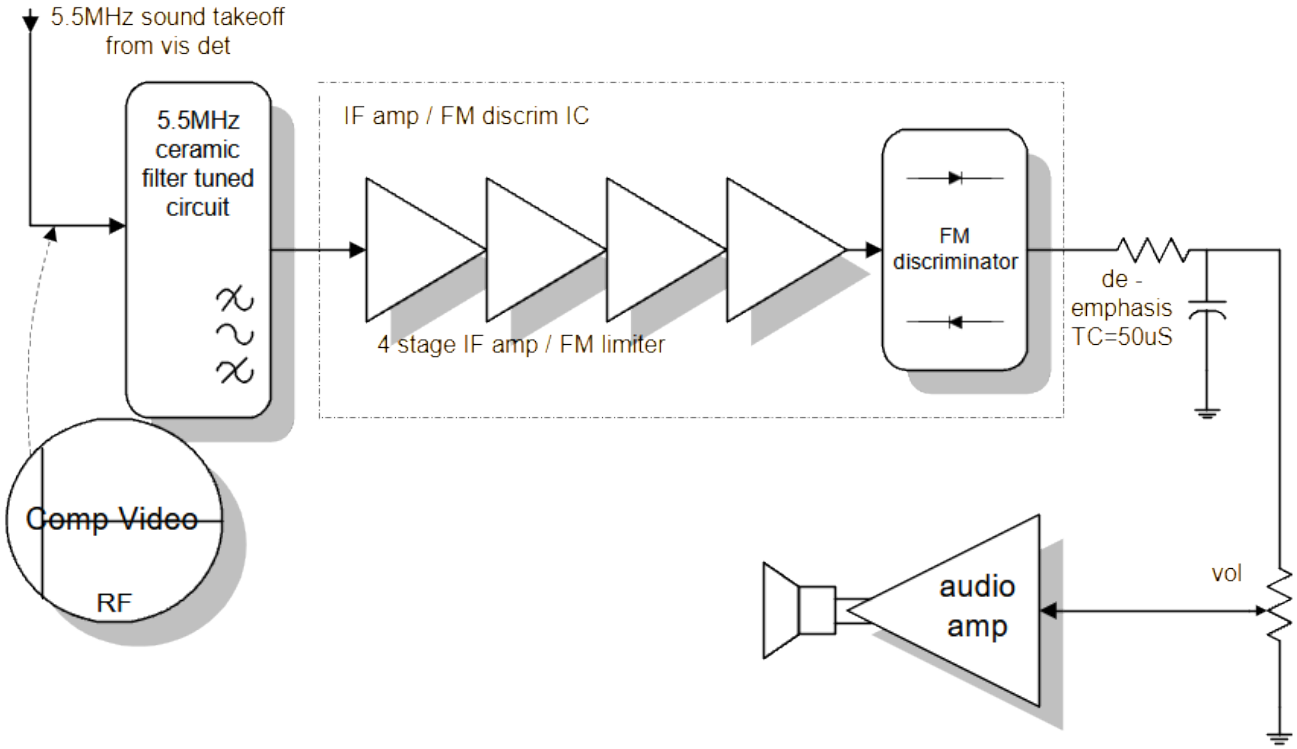
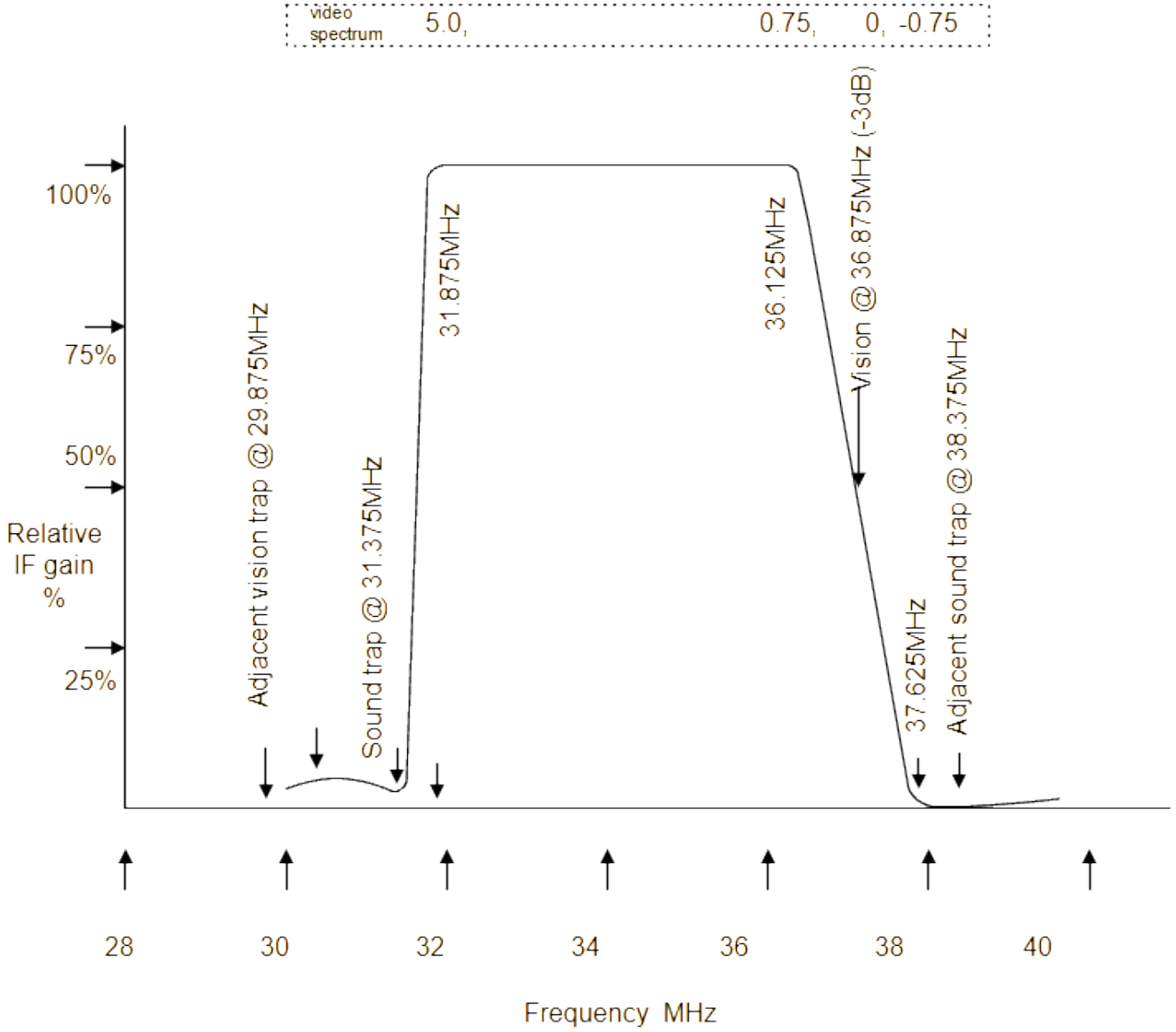
B/W TV Block Diagram

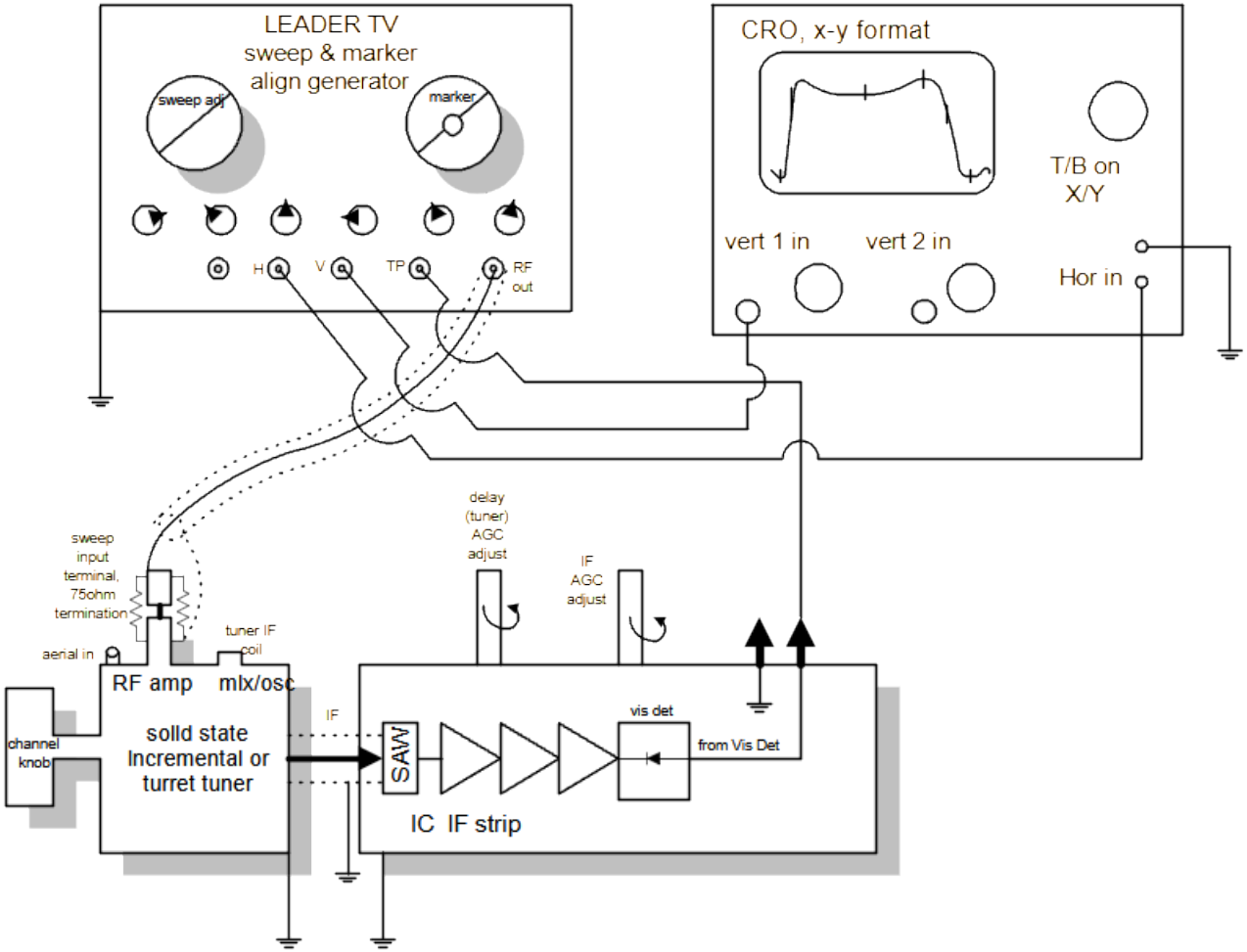
RH-5-2024

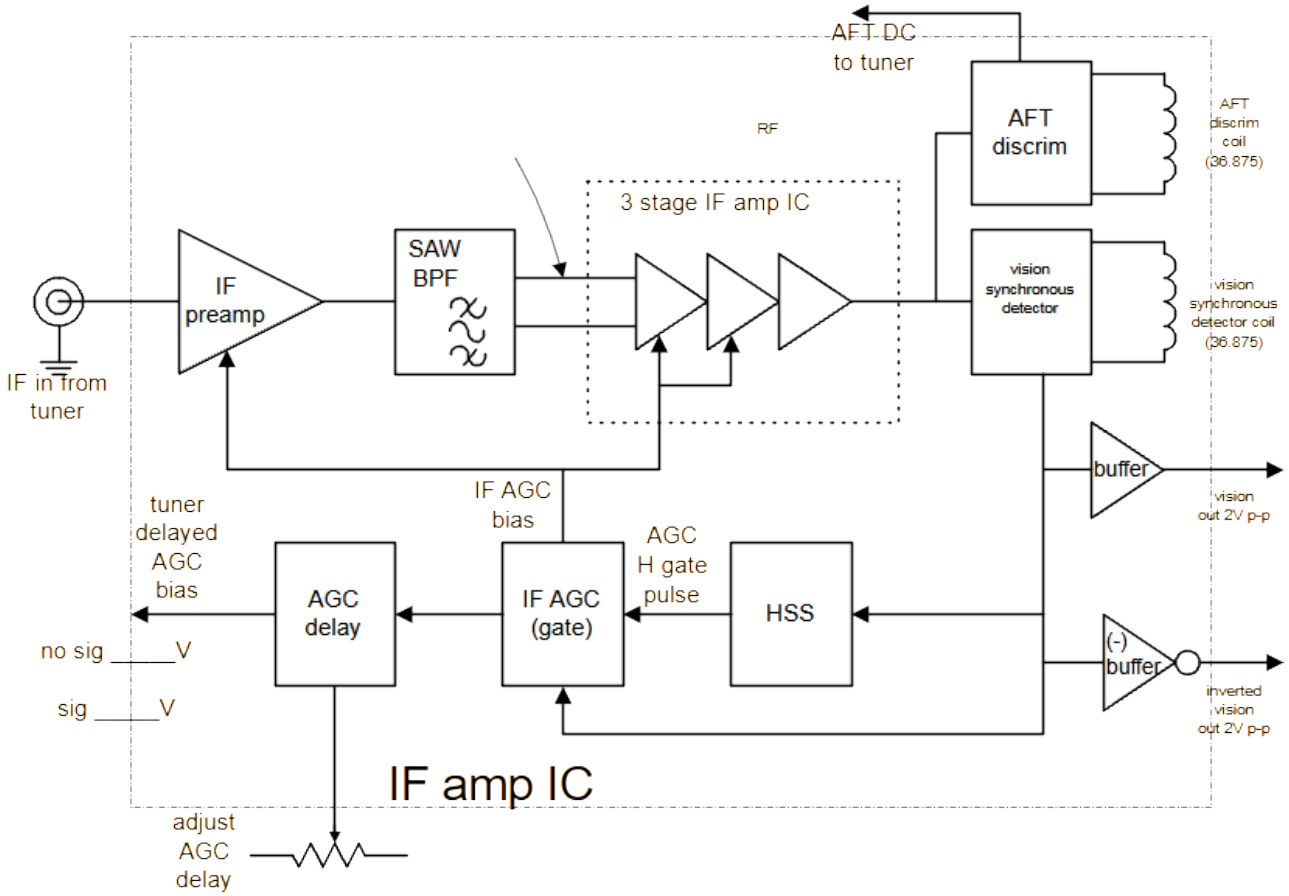



5.5MHz sound takeoff from vis det
5.5MHz ceramic filter tuned circuit
IF amp / FM discrim IC
4 stage IF amp / FM limiter
FM discriminator
de - emphasis TC=50uS
Comp Video
RF
audio amp
vol

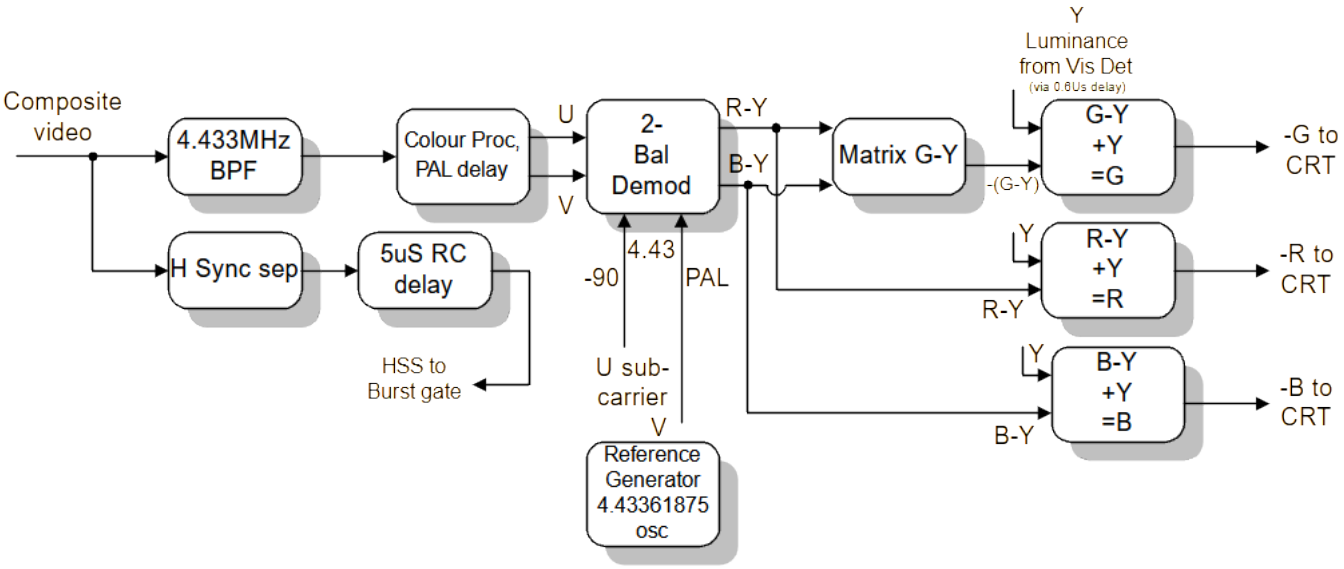


THEORETICAL IDEAL TV VISION IF RESPONSE


LEADER TV
sweep & marker
align generator
sweep adj
marker
H
V
TP
RF
out
CRO, x-y format
T/B on
X/Y
vert 1 in
vert 2 in
Hor in
delay
(tuner)
AGC
adjust
IF
AGC
adjust
sweep
input
terminal,
75ohm
termination
tuner IF
coil
aerial in
RF amp
mix/osc
IF
vis det
from Vis Det
channel
knob
solid state
Incremental or
turret tuner
SAW
IC IF strip


AFT DC
to tuner
RF
AFT
discrim
AFT
discrim
coil
(36.875)
3 stage IF amp IC
SAW
BPF
IF
preamp
IF in from
tuner
vision
synchronous
detector
vision
synchronous
detector coil
(36.875)
buffer
vision
out 2V p-p
IF AGC
bias
tuner
delayed
AGC
bias
AGC
H gate
pulse
AGC
delay
IF AGC
(gate)
HSS
no sig ____V
sig ____V
(-)
buffer
inverted
vision
out 2V p-p
IF amp IC
adjust
AGC
delay

Colour Decoder

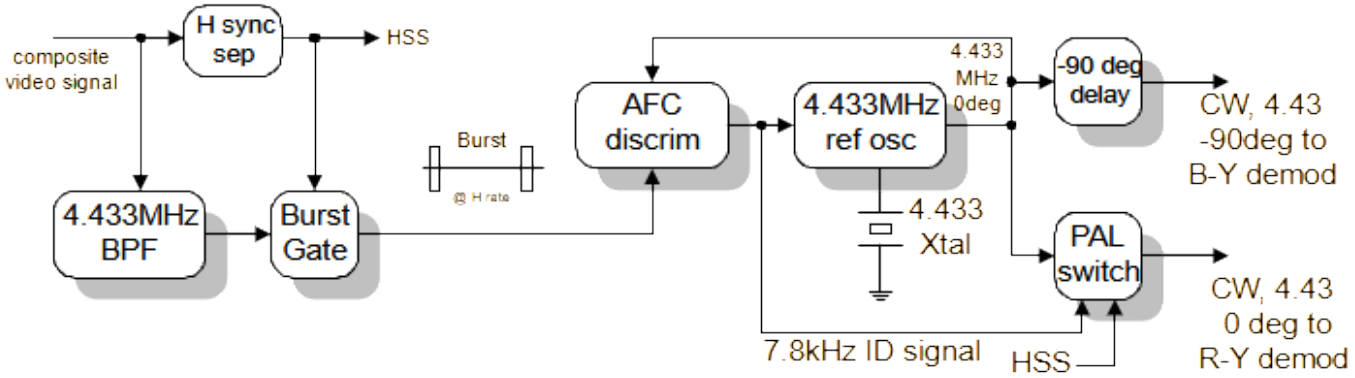


Reference Gen, 4.433MHz

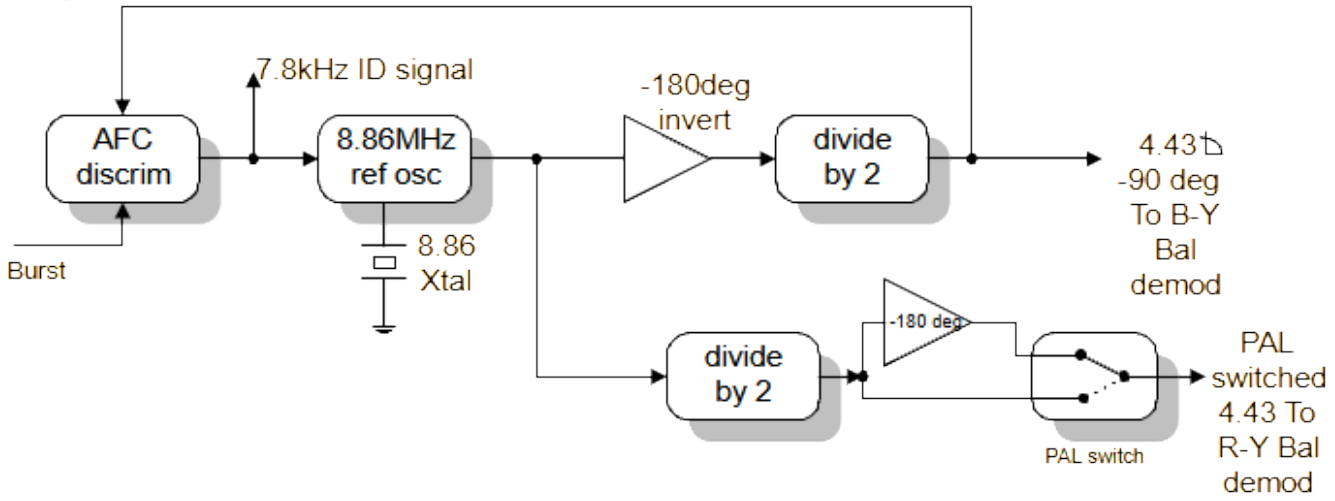
I/p = Burst, +- 45deg, PAL

O/p1 = Sub-Carrier, 4.433MHz Angle = 90 deg for b-y demod

O/p2 = Sub-Carrier, 4.433MHz PAL Switched, Angle = 0/180 deg for r-y demod



Alternative sub-carrier regen (IC)



PURITY ERROR IN LARGE SCREEN CTV CRTs
IN SOUTHERN AUSTRALIA

RH 10/02V2

Introduction

Purity or beam landing error may occur in larger screen CTVs due to the fact that most CRTs are primarily designed for the Northern Hemisphere, and are sold for use by various manufacturers for the Southern Hemisphere. This purity problem may be rectified at manufacture by inverting the CRT with EHT/ultor being at the bottom of CRT (and CRT socket/PCB being inverted). However minor problems may still occur, especially with CTVs sold in lower latitudes such as Melbourne, and to a lesser extent, Sydney. This remaining purity problem is due to the earth's magnetic field not being quite parallel to the earth's surface at lower latitudes, as these lines of force comprise both vertical and horizontal components in the earths' magnetic field at lower latitudes.

TV CRTs are made to have a tolerance to this change in the earths' magnetism with changes in latitude. Unfortunately, some TV CRTs are operated at near the end of their 'purity tolerance zone', and may exhibit impurity in certain circumstances, such as ;

- The CTVs being turned around or rotated slightly whilst operating
- Being operated in too close proximity to extension HiFi loud speakers
- High beam current (bright areas in picture) bending the mask, thus causing short term impurity

These errors may not occur, or the impurity may be less of a problem in/when:

- The TV is adequately degaussed by holding the degauss wand in three different planes/directions and degaussing front, sides, top and rear of the CTV **prior to being sold** or whilst in situ, in the clients home, or both. This removes residual magnetism (magnetic) memory from place of manufacturer to where the CTV CRT is currently located.
- The static purity is corrected with (the correct type) static purity correction magnets, followed by degaussing again.

Degaussing

- Most CTVs own internal degaussing will only operate at power on (**not** from SBY)
- The CTVs own internal degaussing effectively only removes the horizontal field magnetisation magnetic 'memory' component and not the vertical component (of which may still be present from original CRT/TV manufacture, prior to shipping from overseas) ie. magnetic "memory"
- Auto degaussing via the CTV PTC and internal degauss coils, at "power up" initially draws about 5 to 10 Amps and rapidly decays to a value less than mA after a few seconds. Because degaussing coils are wrapped above and below the CRT neck, they produce an intense decaying AC field which is predominantly in the horizontal direction only (field is through the coil), this thus reduces little of the pre-magnetisation (magnetic 'memory') vertical component.
- Manual degaussing (the best type of degauss coil is a coil of 1000 turns, 300mm dia, wire gauge 26swg or approx 0.46mm circularly wound, adequately insulated with a series PTO switch. Degauss strength should be around 3,000 ampere turns, which means this degauss coil must draw a minimum of 3 amps to be effective. Manual degaussing should be with the TV switched off, so as to minimise interaction between the V/H deflection fields and the internal & degauss coils) A normal degauss 'wand' is satisfactory, but for both coil/wand types, the CTV must be degaussed with the wand sequentially facing 3 directions as listed:
    1. Wand pointing towards screen
    2. Wand held horizontally

3. Wand held vertically

The wand must be moved close to the screen in a circular motion, moved around the sides and top and bottom and rear of TV then moved away (quickly or slowly is ok) to about 3 metres and held parallel to the tube face and switched off. Repeat for 3 directions (it is best not to switch the wand off between 3 procedures). The procedure should take about 30 seconds total time.

If degaussing does not fully correct the purity error, then you will find most manufacturers can supply small (1cm x 0.5cm x 1mm) purity correction magnets. These have a white painted end, indicating magnetic N. pole.

Smaller screen CTVs may only require 1 or 2 magnets.
Large screen (34") CTVs may require 4 to 6 such magnets.

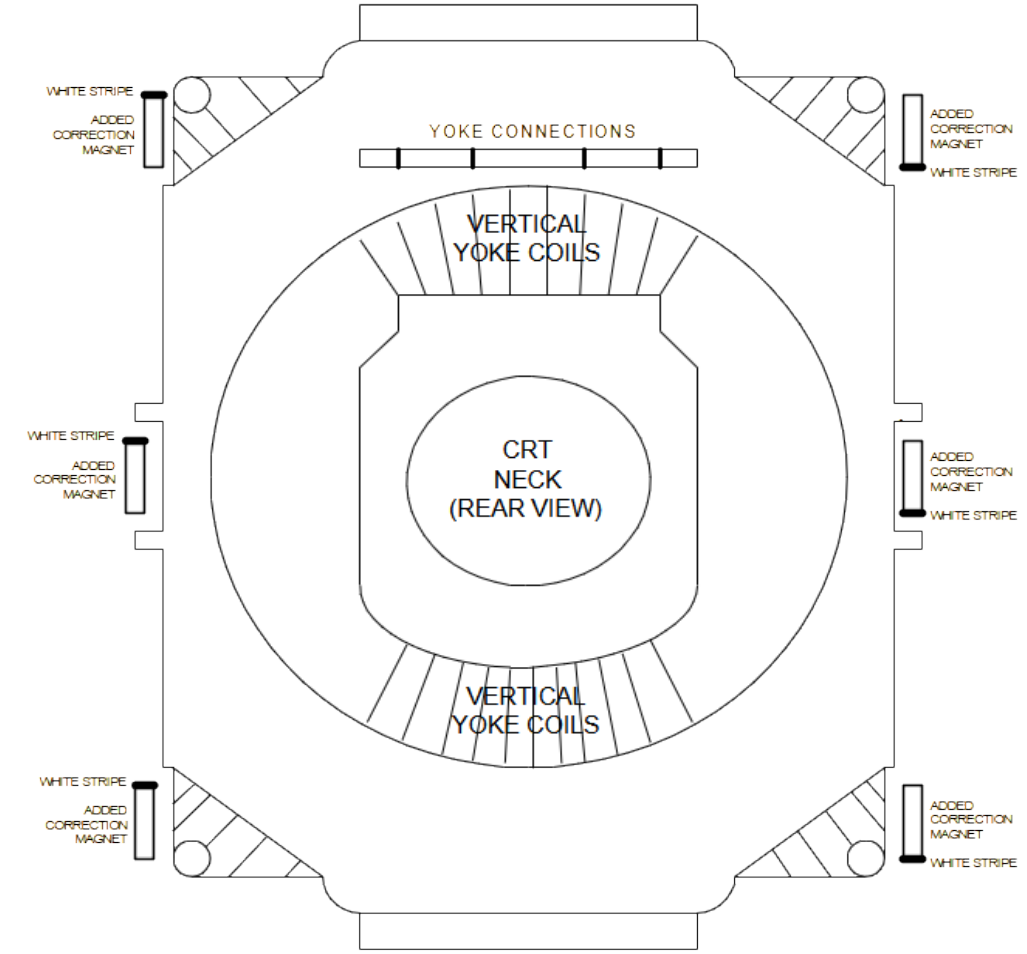
The correction magnet is normally placed in the vicinity of the yoke and / or near the corner of CRT where the purity is at error. If the error is large, the magnet goes near (or onto) the yoke, if the error is small, it goes towards the CRT face (still on the bell funnel). Best purity correction has to be made by rotating the little magnet, it should then be glued to the CRT. Of course the CRT should have been degaussed before and after this operation.

In extreme cases only, for Large Screen CTV.

The 6 magnets are equally, but specifically placed on the sides of the DY, they should be placed on the outer edge of the yoke. This has the effect to make the CRT think that it is mechanically located at around the latitude of Brisbane hence, the CRT is well within tolerance for use in Melbourne, Adelaide and Hobart latitudes.

Again the CRT needs to be correctly degaussed before and after the magnet addition operation.

Magnets placement (6 of) is suggested as per the diagram following:



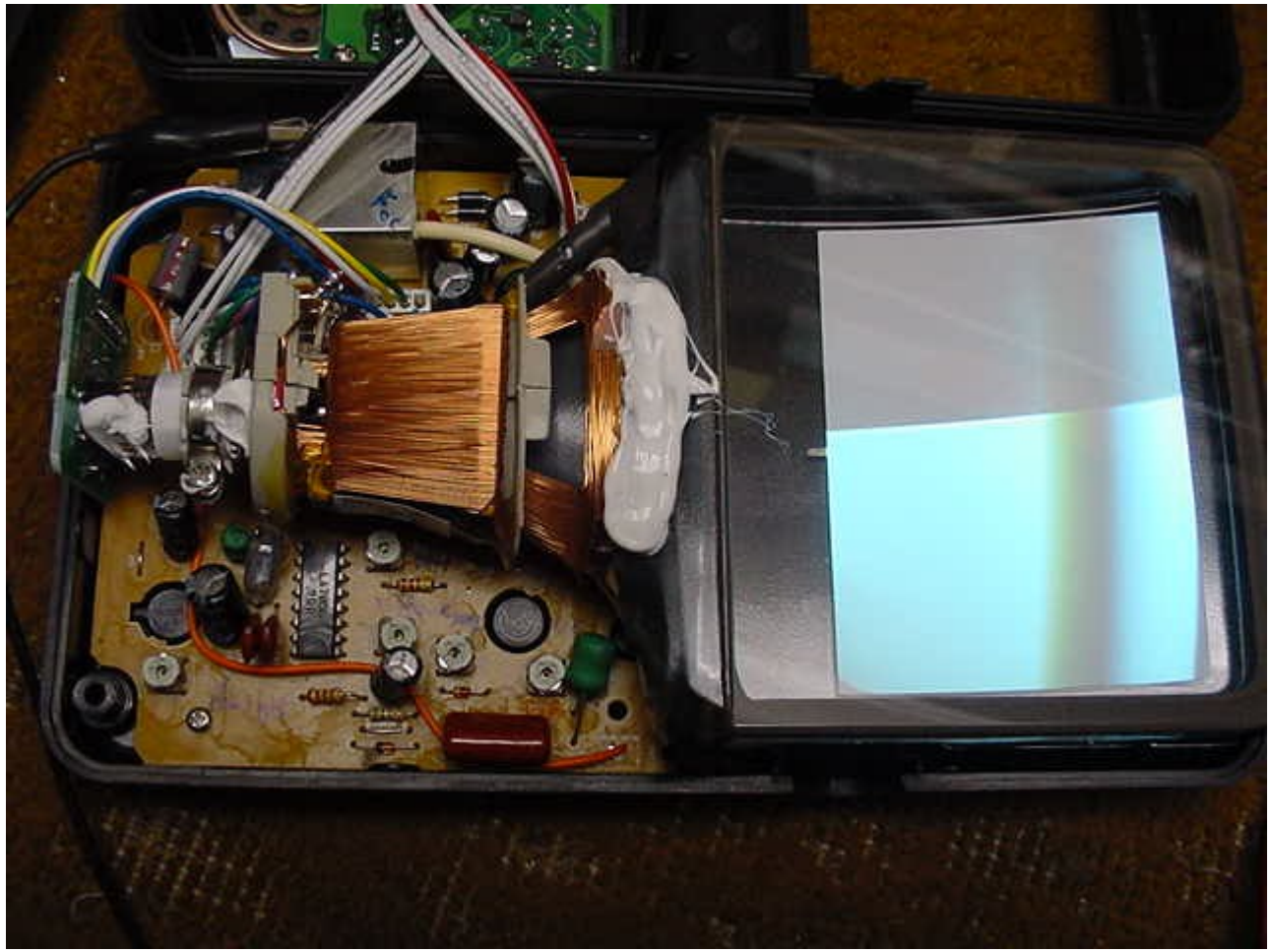
CRT / DEFLECTION YOKE
REAR VIEW: ADDED 6 CORRECTION MAGNETS.
CRT TYPE A79ECU33X01 & OTHERS
SOUTHERN HEMISPHERE, PURITY CORRECTION.

Final Recommendations

1. Degauss all CTVs/CRTs fully prior to despatch and sale to the client
   (Degauss the CTV in the in Factory / Store)
2. Degauss, where possible the CTV at installation, when CTV is in its final location/site, before “power on”.
3. Add magnets only as a last resort. Purity is easiest adjusted on a red raster.
4. Keep the CTVs internal degaussing coils away from yoke, so as to minimise interactive magnetic coupling. Tape them down, if necessary.

Tube Facts, *generalizing*

- A tube lasts about 25,000 to 28,000 hours before a 20% reduction in light output occurs. This is around 10 to 15 years of use at around 4 to 6 hours use per day. CRT life will be shortened if the *BRIGHTNESS* is run at excessive levels.
- For some brands, this figure is lower, about 10,000 hours, and obviously, some are longer.
- Cathode current saturation occurs at about 2ma (full brightness 7 peak contrast).
- CRT life is most critical on heater / filament voltage. Below 6.0 volts, cathode poisoning / oxidation may occur. Above 6.3 volts, premature cathode ageing can occur. This may be verified by looking for ionised dark shiny metallic stains on the inside of the neck, where filament material has evaporated and re-condensed on the glass neck (low emission). Ideal life is around 6.2 volts DC or RMS. A true reading RMS meter needs to be used to measure this voltage. Most DVMs will not read true RMS, even if their specification states so. To verify this, reverse the meter probes and re-measure the heater supply. This especially is the case with H out / FBT derived CRT heater supplies.
- Excess EHT can punch through the neck of a CRT, into the yoke assy, the most common causes are: 1/ Excessive B+ from the switch-mode power supply, most often due to high ESR small electro capacitors, 2/ dry joints on the (tuning) capacitor across the H out transistor.
- Most computer monitor CRTs cannot be rejuvenated either by raising the heater voltage, or by rejuvenating the guns (stripping a layer of cathode emissive material).
- A CRT is generally regarded as “getting old”, at about 50% of new emission.
- The day of the plasma flat panel display is coming.
- The day of the HD plasma flat panel display is coming.



Eurovox Flat CRT TV (Sinclair)